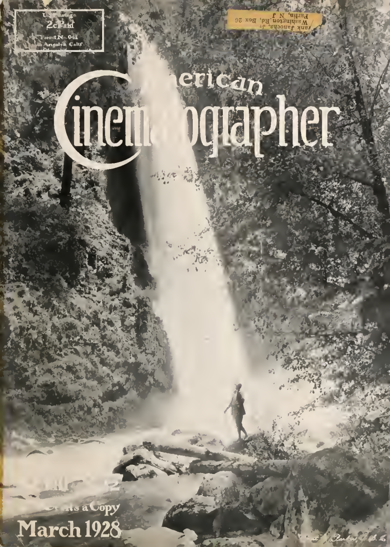

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American Cinematographer
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March 1928

DEPENDABILITY

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Frank Janocha Jr 1925

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American Cinematographer

SILAS EDGAR SNYDER
Editor and General Manager

JOSEPH DUBRAY
Technical Editor

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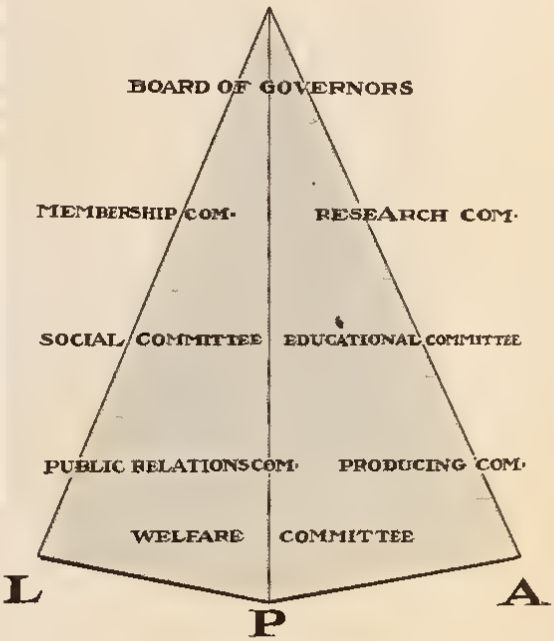
A. S. C.

The Pyramid of Progress



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The S. M. P. E.

The Spring Convention Will Open in Hollywood On the Ninth of April

Mr. L. C. Porter, of the Edison Lamp Works, Harrison, N. J., and secretary of the Society of Motion Picture Engineers, who is in Hollywood arranging for the spring convention of that organization, announces that April 9, has been selected as the opening date and that he expects a good attendance, considering the long distance to be traveled by most of the delegates.

Officers of the Society of Motion Picture Engineers: Left to right they are: C. Francis Jenkins, founder of the Society; John A Summers, secretary pro tem; L A Jones, past president; W C Hubbard, treasurer; J. C. Kroesen, member board of governors; H P. Gage, vice-president; Willard B Cook, president; J. H Theiss, member of board of governors; J. I Crabtree, member of board of governors and chairman of papers committee; F. H Richardson, member board of governors, and Miss Schmidt, not an officer but the one who has for years taken the shorthand minutes of every meeting

The local committees are:

Arrangements—Chairman, Fred W. Beetson; Roy Pomeroy, Paramount; W. V. D. Kelley, Kelley Color; William Sistrom, Metropolitan Studios; A. G. Volk, De Mille Studios; J. C. Ball, Technicolor.

Papers— J. C. Ball, Technicolor; L. C. Porter, Secretary S. M. P. E.; Dan Clark, President A. S. C.; A. G. Volk, John W. Boyle, A. S. C.; Fred W. Beetson; Douglas Shearer, M.-G.-M.; Joseph Dubray, A. S. C.; W. V. D. Kelley.

The entire local motion picture industry will cooperate in the entertainment of the engineers and their sojourn here will be made memorable. The program will be announced in the April CINEMATOGRAPHER.

The first introduction of the S. M. P. E. to Hollywood was in 1922 when Harold E. O'Brien, then of Lasky's, wrote a monograph on the Society for THE AMERICAN CINEMATOGRAPHER, excerpts from which follow:

In February, 1916, twenty-five men met in New York city and organized the Society of Motion Picture Engineers. The objects of this organization, as stated in the constitution and by-laws, are: "Advancement in the theory and practice of motion picture engineering and the allied arts and sciences; the standardization of mechanisms and practices employed therein, and the maintenance of a high professional standing among its members."

"Ever since its organization, the Society has shown a steady and healthy growth. It has become to the motion picture world what the Society of Automotive Engineers is to the automobile industry; the American Institute of Electrical Engineers to the electrical industry, or the Illuminating Engineering Society to any who use light. The society is entirely self-supporting and its finances in healthy shape. All of the officers serve without pay.

"The society meets semi-annually, in the Spring and Fall. These conventions afford a common ground on which men in the various branches of motion picture work meet each other to exchange and discuss ideas, to standardize methods and equipment. This work will unquestionably result not only in the production of better pictures, but also in improving their surroundings and broadening their application for scientific research, education and entertainment.

"The transactions of these conventions are issued semi-annually, and contain very valuable data on all branches of the industry.

"The present membership of about two hundred is drawn from many states in the U. S. A., several foreign countries, Canada and Cuba. So you can realize that no matter what your connections with the motion picture industry may be, whether technical or otherwise, you would find something of value and interest in the society.

"In October of 1920 I attended the convention at Dayton, Ohio, and I assure you it was well worth while. It was a pleasure to meet member engineers from the various large manufacturers of equipment, like Eastman, Bell & Howell, General Electric, Westinghouse and many other representative firms.

"These engineers seemed eager and anxious to meet others engaged in the industry, particularly those directly connected with the actual production of pictures, for they realize that the success of their product depends upon its ability to meet the demands at the studio, and many of us know that much of the apparatus we are using in some lines is more or less of a makeshift that has been handed to us in about the same form it was used on the stage years ago, or as it is used in some other commercial lines at present.

"This is particularly true of electrical equipment. Think of the great improvements that can be accomplished by showing these manufacturers that certain changes should be made in their product in order that it would better meet the needs of the motion picture industry. You will find them quite willing to learn these needs and to co-operate with you. It is up to us to work with them so that the entire industry may benefit.

While at Dayton I told the membership committee that I felt the society needed more members among the technical men of the studios, and that in order to stimulate active interest in the greatest production center of the industry, located in Hollywood, we be allowed to organize a local chapter along the same lines as the American Institute of Electrical Engineers and hold local meetings where papers would be presented and discussed. Also that representative members from Hollywood studios be appointed on the various committees of the society in order to obtain co-operation and best results. The committee welcomed these suggestions and agreed to act favorably upon such a plan.

"I believe we will all concede that the technical branches of the industry, with the exception of the cameramen and directors, are not very well organized, and that great benefits can be reasonably expected by a large membership in such an organization as the Society of Motion Picture Engineers. Just think of the results accomplished in other lines by the American Institute of Electrical Engineers, who have established standards that are recognized throughout the electrical industry. Is there any reason why the motion picture industry cannot do likewise?

There are two classes of membership, associate and active. The associate membership is for those who are not in active engineering work. An associate member is entitled to attend all meetings, discuss papers and receive all transactions, etc., but is not entitled to vote for officers. An active member is entitled to all of these privileges.

"The qualifications for an active member are listed as follows: An active member shall not be less than twenty-five years of age, and shall be:

(a) A motion picture engineer by profession. He shall have been in the practice of his profession for a period of at least three years, and shall have taken the responsibility for the design, installation or operation of systems or apparatus pertaining to the motion picture industry.

"(b) A person regularly employed in motion pictures or closely allied work, who by his inventions or proficiency in motion picture science or as an executive of a motion picture enterprise of large scope, has attained a recognized standing in the motion picture art.

"An associate member shall not be less than twenty-one years of age, and shall be a person who is interested in or connected with the study of motion picture technical problems or the application of the same.

The Hollywood members of the S. M. P. E. are:

Joseph A. Ball, Technicolor Corporation, 1006 N. Cole avenue, Hollywood, Cal.; Lester E. Cuffe, Hollywood, Cal.; Max Handschiegel, 1040 McCadden place,

(Continued on Page 20)

Left to right: J. C. Kroesen, C. E. Lamp Works, Harrison N. J. Lewis M. Townsend, supervisor of projection for Eastman Co., Rochester, N. Y.; F. H. Richardson, Chauncey L. Greene, W. T. Yutzy, both from Minneapolis, Minn.; Ira Gordon, projectionist, Akron, Ohio; Arthur Gray, chief projectionist, Lancaster Theatre, Boston, Mass.; "Bill" Kunzman, National Carbon Co., Cleveland, Ohio; C. Francis Jenkins, "Founder of the S. M. P. E." (Name Omitted); J. H. Kurlander, of the Brenkert Company; Samuel Burns, vice-president International Projector Corporation, (Name Omitted); P. A. McGuire, International Projector Corporation.

EDITORIAL--The Voice of the A. S. C.

By unanimous vote of the Board of Governors of the A. S. C., Mr. Joseph Dubray, technical editor of THE AMERICAN CINEMATOGRAPHER has been chosen to represent the Society at the Forty-sixth Annual Convention of the Photographers Association of America to be held at Louisville, Kentucky, March 27th to 30th inclusive.

As a soldier, linguist, orator, writer, researcher, scientist, photographer and cinematographer, with a background of thirty years to enrich his store of knowledge Mr. Dubray is an ideal courier to carry the message of the A. S. C. to the P. A. of A. and he will go prepared to show the assembled artists in the Kentucky metropolis not only how motion pictures are made, but the equipment with which they are registered on the film and he will tell the story of production with both the spoken word and a motion picture shot by members of the A. S. C. for the occasion.

The P. A. of A. is one of the most substantial, prosperous, enterprising and progressive organizations in America. With forty-eight years of history behind it the P. A. of A. has come to be an American institution in the best sense of the term and it ranks internationally with the Royal Photographic Society of England.

One year ago last October this peppy organization took the first steps toward a national advertising campaign to promote the interests of the professional photographer and to date they have raised more than $1,600,000 for a four years' campaign.

It has a membership of over 4000 and has in two years multiplied its association activities about 400 percent.

The A. S. C. thus officially acknowledges the honor done it by the P. A. of A. in extending an invitation to our Society to send a representative to Louisville and it feels sure that out of this entente cordiale will arise an enduring spirit of co-operation to the glory of photography not only in America but throughout the world.

The A. S. C. also takes this occasion to congratulate the P. A. of A. upon its phenomenal success and growth and pledges its friendship and best efforts in assisting the Association to work out its program of constructive propaganda.

The Mazda Marathon at Warner Brothers Studio has been a great get-together affair for the technicians of the Hollywood production groups and now that we are together let us keep together and, as one man, work to sell the pictures to the public. This can best be done by every man giving the best that is in him to the picture. These are the days of "shopping." The picture fan shops for his picture entertainment as he shops for his necessities at the stores. In other words, we must not only sell the pictures to the public but we must make them *stay* sold.

The A. S. C. is indebted to Mr. C. Curtis Fetters, A. S. C., for the first unit of the stills exhibit now in process of assembly and installation at the Society's headquarters in the Guaranty Building, Hollywood. Mr. Fetter's unit includes 27 stills, three of them hand colored, and to say they are very beautiful is but faint praise for a wonderful artist.

Robert M. Parker, A. S. C. is preparing a unit for another panel of our assembly room and all other members are not only cordially invited, but urged to contribute units, numbering no matter how few or how many stills in order that our walls may be covered with the finest exhibit of still pictures in America. That's our ambition. Come in and reserve your panel and send in your works of art.

Our front cover this month is a study from the camera of Robert M. Parker, A. S. C. Its beauty and perfection of art is entirely worthy of a member of our society and the engraver's attractive reproduction has decided the editor that henceforth the front covers of THE AMERICAN CINEMATOGRAPHER will be reproduced exclusively from still pictures shot by artists of the A. S. C. Send in your masterpiece.

The incandescent light tests since January 18, in progress at Warner Brothers Studio will continue into March. Up to time of going to press upwards of fifty tests had been made by the same number of members of the A. S. C. and 78,000 feet of film had been used. No report of results can be published until the committee in charge has summed up the tests in detail which will not be until all returns are in. It may be said, however, that the demonstration promises important developments to the great benefit of the photographic department of the industry.

Just what is all this propaganda against Western Pictures about? Why the eagerness to kill the goose that laid the golden egg for so many producers. Has somebody an axe to grind or is it just a case of movie blues?

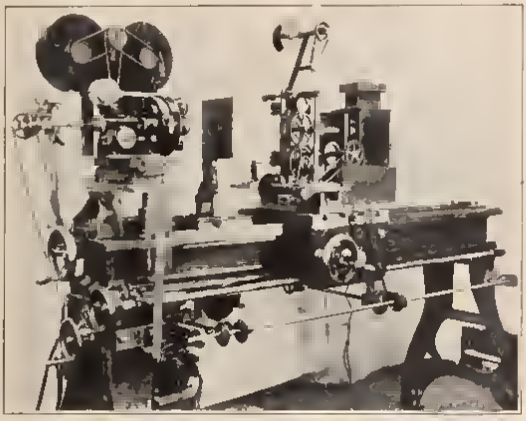
A. S. C. Outposts are being farther and farther outflung Len Roos, A. S. C. is in Siam; Claude Carter, A. S. C. is in Sydney, Australia; John Dored, A. S. C. is in the Baltic provinces; Rene Guissart, A. S. C., is in France; Claude McDonnell A. S. C., is in London, England; J. B. Shackelford, A. S. C., is leaving in the spring for the Gobi Desert; another brother is leaving soon for Central America and still another for South Africa. Verily the A. S. C. is rapidly becoming international in its activities.

For Trick Work

Mr. Fred A. Barber Announces the Perfection of a Wonderful New Optical Printer

By Herford Tynes Cowling, A. S. C., F. R. P. S.

The printing of motion picture films by projection from the negative film onto the positive film is almost as old as the motion picture business. Nearly every inventor who worked with motion pictures at the inception of the industry used whatever size film that he fancied suitable for his purpose. Even after Thomas A. Edison standardized the size of the film to practically the same as it is today, other companies continued to operate with odd sized film



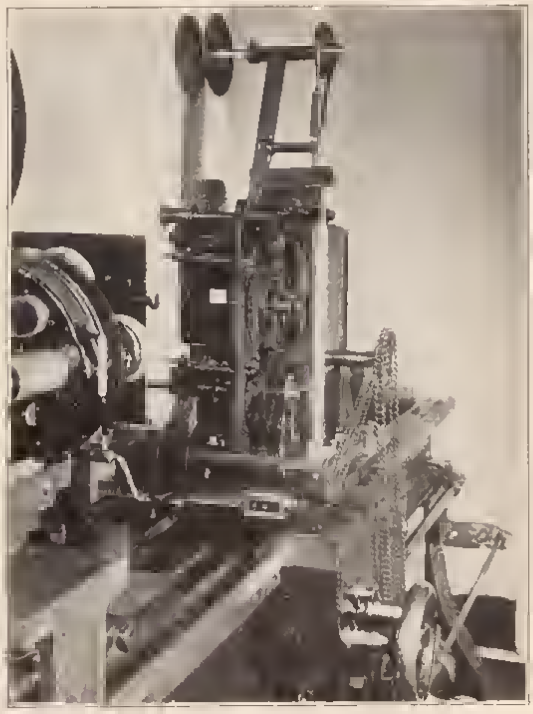
No 1—Complete view of optical printer ready for operation.

until convinced against their will that they could not go against the principle of standardization. In order to make use of the negatives which they made, they found it necessary to print their larger sized negatives on the Edison or 35 mm. stock. Most of these odd sized negatives of any commercial value were larger than 35 mm. in width and in order to make standard prints they used crude optical printers constructed on the same principal as the reduction printers which are used today for the production of 16 mm. prints from 35 mm. negatives. Usually these optical printers consisted of two projection machine heads mounted on a board or table with a lens between them and a lamphouse behind the head carrying the negative film. By means of this arrangement a small picture of the negative could be projected upon the positive film in the standard projection head. By operating two machines in unison a small print was made from the large negative.

Standardization Essential to Progress

Although Edison standardized the size of the film it was not until a number of years later that the relation between the frame line and the perforations was standardized by the Society of Motion Picture Engineers. Today the line between the frames or pictures comes midway between perforations but before the standard frame line was adopted there was no uniformity and and the line might be on the center of the perforation, between the perforations, or anywhere else. Where more than one camera was used on a production the picture jumped out of frame at every camera change so that the projection machine operator had to keep his hand constantly on the framing lever. Optical printers were used to a limited extent for making prints with a uniform frame line. Some of the news companies like Pathe reperforated negatives to a uniform line until the adoption of the standard frame line rendered this unnecessary.

When the law forbidding the inter-state shipping of prize fight films was passed optical printers were put in operation with the two heads on opposite sides of the state line and the picture was projected across the line onto the film on the other side. Once more genius went



No. 2—Detail view of changeable frame line projection head on Barber Optical Printer.

unrewarded for the judge ruled that although the "shipping" consisted in transmitting such intangible things as rays of light the defendant was nevertheless guilty under the law.

(Continued on Page 22)

Movie Make-Up

Is Make-Up to Be or Not to Be---Panchromatic Film Causes Misapprehension

By JOSEPH DUBRAY, A. S. C.

The generalization of the use of Panchromatic emulsions in motion picture productions has brought about a situation which we will call unfortunate, though we are prone to use a much stronger adjective the more emphatically to lay stress upon the argument.

The use of panchromatic film will release the actors from the use of make-up. This is the dangerous conclusion arrived at, we do not know from what source or why. Just one of those misunderstood statements which pass from lip to lip until they take on the proportions of a dictum and insidiously sap the very existence of an absolute necessity.

On the advent of Panchromatic film a more perfect rendition of colors and tones was announced and the subsequent changes in make-up were heralded: a *change* in make-up but not its *abolition.* The declaration made at the time that less and more natural coloring in make-up could be used, was construed by many as the knell announcing the death of make-up, and grease-paints and powders were gaily tossed aside in spite of the protests of the cinematographer—even in spite of some of the unpleasant results thrown on the screen and blamed upon everything and everybody instead of being charged upon their real cause—the absence of make-up.

Let us analyze all causes and effects.

Make-up, beside tricky characterizations, has been deemed essential in the past because;

First: The photographic rendering of skin texture and colorings could not ring true with the non-panchromatic emulsions.

Second: Imperfections of contour and features, disfiguring marks undetectable by the eye in normal conditions, but emphasized by the camera and by the tense attention paid by an audience to the greatly enlarged picture on the screen, could be corrected and rendered invisible.

Third: The contrast of skin textures or colorings existing in nature and greatly emphasized and exaggerated by the photographic process could be reduced to a more pleasing uniformity, more true to the visual, natural impression.

Fourth: Changes brought forth in the general coloring of the features of the players by uncontrollable elements—such as, for instance, the tanning or sunburning of the skin through prolonged exposure to the elements —could be controlled and checked so as to keep the true characterization of the role throughout the picture.

Fifth: Evident signs of fatigue prominently visible and occasioned by the strenuous work, to which a player is subject during the making of a picture, could be kept under control and again, the continuity of characterization kept intact.

These are the main reasons which made the use of make-up imperative and we could keep on indefinitely citing particular cases demonstrating the essentiality of this artistic means of surmounting difficulties otherwise impossible to overcome.

Now what are the effects of Panchromatic film? A better rendering or translation in neutral tone of the varied colors; and this, to a certain extent, diminishes the necessity of heavy and unnatural looking make-ups that have been used in the past, but it *does not correct* the differences in color and unsightly patches latent in the smoothest skin and the most pleasing complexion which the camera unmercifully discloses.

Panchromatic film is an improved material by means of which the cinematographer can express the photographic qualities of the subject or scene he is photographing, but it has not the supernatural power to correct or control any of the above mentioned causes that make the use of make-up imperative.

It would seem ridiculous to expect Panchromatic film to perform plastic surgery or to perform the duties and labors that fall upon the retoucher of portrait photography, but this is, in fact, what it is asked to do when the make-up is dispensed with.

The skill and artistry implied in the application of make-up replace the deficiencies or better palliate the crude verities disclosed by the photographic emulsion, be it ordinary, orthochromatic or panchromatic. This skill and artistry represent the human element of added beauty to the better rendition of nature's gifts.

H. R. Poore expressed a great axiom when he said: *"Science has to do wholly with truth, Art with truth and beauty, but in establishing a precedent, puts beauty first."* The role of make-up is to put *beauty* in truth. It serves to correct the imperfections of nature and to add that element of Beauty that we call Art.

Now, the imperfections of nature are not in motion picture photography confined solely to the physical appearance of the subject or to the changes that may happen to his skin, smoothness and coloring from external causes, such as a slightly diseased condition provoked by prolonged exposure to the atmosphere, but these imperfections are also provoked by the limitation imposed upon the cinematographer by the mechanical, chemical and optical elements that are at his command and contribute to production of motion picture photography.

Most important of all are the limitations and peculiarities inherent in the light-sensitive material that forms the image that we call a picture.

It would be out of place to enter here into a technical discussion of this matter. Suffice to say that profound study and prolonged experience are necessary to acquire a thorough knowledge of these limitations and peculiarities and to become skillful in overcoming them.

Of prime importance is the rendition of tone values which is nothing else but the result of the photo-chemical action of the light reflected by the subject upon the sensi-

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Economy of Production

Evidences of Earnestness Seen in the Co-operation of the Academy and the A. S. C. in the Lighting Tests at Warner Brothers

By Lewis Physioc

We were beginning to think that the cry of economy was the usual motion picture "fadeout," for want of a better expedient, and we were just about to echo the old fabulistic simile "wolf! wolf!" but we were checked in our pessimism by some recent signs of renewed activity. The co-operation between the Academy of Arts and Sciences and The American Society of Cinematographers, in their experiments with incandescent lights at the Warner Brothers' Studios is an indication of a genuine desire, on the part of these technicians, to test the possibilities of economy in this important department.

These evidences of earnestness and sincerity should encourage the lowliest among the craft to express themselves, without fear of having imputed to them the least thought of impudence or presumption. Let us, rather, credit them with a genuine desire to do their bit towards the solution of the great problem. Everyone should be anxious and willing to contribute something to a movement that must be right since all seem to agree that it is necessary.

First of all, let us determine whether this picture making is a business, an art or a plaything. Each of these definitions has its claims to patronage. The magnitude to which it has developed as an industry proves that some hold it to be, purely a business proposition. The product, itself, demonstrates that civilization has developed a new and wonderful art. Popular fancy proclaims its value as an entertainment, and the delight of being associated with the actual production has led certain men of means to sponsor it as a hobby and they have enjoyed the two-fold pleasure of indulging a crotchet together with financial returns beyond expectations, to say nothing of the pleasure of public applause that acknowledges good sportsmanship, patronizing the arts and sciences and general benevolence.

Now let us consider the thing as an art.

The masterpieces of all branches of art teach us one truth that stands out above all other considerations; it is the fact that all great works of mankind are the result of some beautiful inspiration, engendered, primarily, in the heart of man, a noble desire to do something to make his fellows' existence a happier lot; to develop in them an appreciation of all things beautiful—music, printing, sculpture, architecture, astronomy, etc.—the development of the spiritual, intellectual and moral nature by works of literature. Whatever it is, the ultimate idea is to add to man's happiness and welfare.

Now the generous applause of a delighted public immediately introduces the natural consequence—material reward, which, in turn, establishes comparative values of great services rendered to mankind, with the ultimate and inevitable introduction of business. It is not surprising, then, that there might be aroused in man other passions as natural to the human breast as the nobler sentiments of benevolence—cupidity is conceived, love of praise, an ambition to outstrip the other fellow, all of which are temptations to debase the motives of art and employ them for material gain by appealing, indiscriminately to the passions. All this immediately establishes a natural affinity between these two elements, art and business. Men of letters have analyzed the great literary works and attempted to classify the elements of popular appeal, trying to discover the public taste, and have humored them fairly successfully—artists paint certain subjects that have proven good sellers—picture producers have followed the lead of great successes, and the result is that all of the forms of art, through comparison and criticism, are rapidly developing into a set of formulae, and we begin to fear the responsibility of judging innovations in technique as well as originality of conception and design. To this fact, is due the tendency to produce pictures for the critics who are supposed to reflect the public taste. Maybe it is erroneous to suppose that we can direct the public mind through the assumption that "we know what the people want." A survey of the great works of mankind seem to suggest that the people have had very little to say about what they wanted but, when given something that has pleased, they have always given generous proof of their approval. This should be some encouragement for great minds to proceed bodily, uninfluenced by rule or formula, honest, first of all, with themselves, in their effort to do their best, regardless of labor or cost. A painter cannot be stingy with his palette, poor colors will not endure and good ones are expensive. We must also remember that by formula or precedent, we may never produce another Shakespeare, da Vinci or Phidias but civilization will always enjoy beautiful and original works of other great minds—there will always be great motion pictures.

Now when it comes to counting the costs we must set reasonable bounds. We must acknowledge that we cannot emulate the fastidiousness of Thomas Gray who devoted seven years to his Elegy or a Macaulay who insisted on a final edition of his history to correct a single sentence, because we are engaged in an art that is so closely identified with business as to demand that we make every effort to reconcile the two. This we attempt by acknowledging that, both in art and in business, there is a curriculum that cannot be denied or evaded. Let us study this by offering a simple, but very relevant similitude: we may give a child a kodak and a generous supply of films and expect that by the merest chance he may bring in one or two very pretty pictures; and that by continually comparing failures with successes he may eventually develop an ability to achieve, directly, what he designs. This is a costly method but it is the one by which many of us have obtained our motion picture training. It has been the general process of the business for the past twenty-five years. We had no other resources. We had no trained exponents to show us short cuts to results. We suddenly found ourselves in the midst of a tangled web of beautiful possibilities and left to extricate

ourselves as best we could, while trained dramatists, technicians and business men watched the process with ridicule, resentment and, finally, with envy. But despite the fact that this school has been an expensive one the picture business has developed, in the very short period of twenty-five years, the most remarkable array of talent—business executives, technicians, writers—artists in all branches, probably, in the history of civilization—some of them geniuses, that but for the advent of motion pictures might have continued in obscurity.

But unfortunately, in this medley of recruits, we have discovered many who were not endowed with the natural qualifications to enable them to follow in the march of progress, many not capable of maintaining the leadership they had been accorded, and that all new movements need, and we are now face to face with the necessity of organizing and preserving to the industry those whose inherent talents justify their positions, and of cutting away the "dead wood"—a cruel expression, but as in all cases, the law of evolution asserts itself and we acknowledge the survival of the fittest. It is a difficult proposition—there is a great deal of sentiment connected with it—we hesitate to thrust out old pioneers because they are foot-sore and unfit to continue in the march of progress; but cold-blooded business refuses to recognize sentiment. Who is to inaugurate this reorganization?—the industrial leaders. They must discern the talent where it appears.

There is much talk, now-a-days, about the young man. Many account for the present cry for economy with the phrase "youth has had its fling," but if genius is exhibited in the young it must be recognized. Nor must the judgement and years of experience be overlooked as a value in directing youthful pep and enterprise—and great ability, both in youth and maturity, is often to be found in modest retiring natures. It is to be deplored, but this is a condition that is to be expected in a profession such as ours where publicity and influential representation is the only entree.

This we do know, by the traditions of the ages, "youth seldom counts the costs," which brings us to the queston under consideration.

When we consider the variety in character of the many pictures that are made and compare the results as to popular reception, this idea of costs should seem a simple one. A picture can be made for five thousand to five million dollars, which involves several considerations; first, what is the popular appeal? Is it simple beauty and nobility of theme adequately presented? Is it the extravaganza; sensationalism or star exploitation? Secondly, which of these have brought the greatest returns in proportion to amount of money invested? The first we may never be able to determine accurately but it seems logical to presume that the experience of the producer, the exchange man and the exhibitors should enable them to appraise these values. We assume that these appeals from the producers respecting economy is the result of these findings and that we have set a pace for elaboration of production to which we must surrender, and if this is the fact, it is incumbent upon every one engaged in the art, to aid in this program of retrenchment.

We cannot deny, however, that this movement will present many problems to the producer because there may develop a very natural jealousy among the various departments as to their importance, for it has already been observed that each one can give commanding arguments in its favor. The writers claim the importance of the story, the stars' popularity proclaims their position, the photographic department will tell you that "the film is the cheapest item of all," the art director asserts that all are sacrificed without adequate settings and so on through the entire organization. But when we consider a single picture that involves such items as a hundred thousand dollars for the story, an equal amount for a star's performance, double that amount for sets we begin to feel that even forty thousand dollars for film is an item to be considered.

But all troubles may be corrected at the source; therefore let us ask ourselves whether the present tendency towards expensive productions is the result of an honest desire for artistic excellence or merely a competitive policy, both as to magnitude or organization and extravagant display—a desire to out-do the other fellow. If this is the case, a solution may be found in a superior judgment as to what are the real elements of artistic production, a true discernment of talent and a judicious marshaling of these forces, in which event, competition will assert itself by force of merit rather than by the intimidation of expensive display.

Primarily, we are engaged in the art of picture making, and the elements of a picture should be simple, for those who have studied painting or the other branches of art, cannot be persuaded that there is a great dissimilarity in the rules of artistic expression, whether in motion pictures or the other forms. The first principle taught us is simplicty—of conception, composition, tone values—a simple palette, broad brushes and bold strokes. Now those among the producers who can draw a line between exaggeration of detail, extravagant display, a general complexity of all the elements and an elegant and a convincing simplicity, will produce more artistic and cheaper pictures. This is not easy; it represents the acme of artistic training.

It might appear presumptuous for any one to try to consider, generally, items for improvement, rather let us look to each department for their earnest intention, but there are certain observations continually recurring to the earnest student. The great sums of money involved frighten away all thought of innovations. We fear to risk a story that has not been proven by the publisher, and yet we feel that there may be overlooked many fine originals by people trained to picture writing. Directors take no chances of a failure—thousands of feet of film are expended in safety or covering shots, increasing the troubles of the cutter and endangering simplicity and fluency of continuity. Cameramen are excited to little extravagances —large rolls of film are thrown into the waste cans because of the fear of running out on an important scene, in the justifiable explanation that time is cheaper than film. We have not yet discovered, nor have been willing to acknowledge the limits or discriminating power of our two dimensional camera, and until the perfection of stereoscopic photography is a fact, the magnitude and elaboration of settings will be sacrificed to the flat field of a mono-lens rendition. And the very nature of this one-eyed monster makes it possible to cheat the cost of sets by substituting flat paintings, photographs, miniatures, etc., by camera tricks.

A fastidious attention to detail is also reflected in the choice of furnishings and materials. Priceless tapestries and antiques are placed where our cyclops of a camera

A. S. C. as Firemen

The following excerpt from the Illustrated Daily News pays a well deserved tribute to the members of the A. S. C. who volunteered as firemen at the Warner Brothers' studio fire and kept the blaze under control until the city fire fighters arrived:

Fire which caused about $100,000 loss to Warner Brothers' studio at Sunset boulevard and Van Ness avenue, and for a time threatened the entire plant, was brought under control last night by nine fire companies answering a second alarm, after the entire block between Sunset boulevard and Fernwood street on Van Ness avenue had been burned. The loss was covered by insurance.

When the alarm was turned in a group of cameramen were attending a lecture in the studio and their prompt first aid in fighting the fire is credited with saving $1,000,000 worth of unreleased film stored in a concrete laboratory building, which turned out also to be the strategic point of the fire fight, according to Chief Engineer Frank Murphy.

The fire started on warehouse stage 4 of the studio and was discovered first by an unidentified watchman across the street, who turned in the alarm. Cause of the blaze was spontaneous combustion in used sets stored in the building, firemen said. Police said it started in the transportation office.

The stage, another set storehouse and the studio transportation office were destroyed on the studio lot.

Mr. E. W. Johnston, of the Baush Lomb Optical Co., of Rochester, is in Hollywood conducting an investigation on lenses applying to both photographic and projection purposes. His visits to the offices of the A. S. C. and to the Warner Brothers' Studio during the incandescent-lamp tests have already resulted in a more perfect contact between cinematographer and lens manufacturer, and good RESULTS are expected to follow.

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cannot reveal their intrinsic value. These are all small items but when considered in every department and footed up at the end of every picture amount to considerable.

As regards the star, let us not forgt that as long as man has existed he has had his idols—hero worshiper, calls it. Nature's endowments in the form of beauty, personality and talent have always been idolized and always will be. So let us not quarrel with the stars, rather let us try and have them reason with us. The only unfortunate feature of the star system is that many good stories may be sacrificed on account of their being unfitted to the star.

This last consideration suggests an element in picture making that we cannot refrain from mentioning, and that is the independent producer. Independent seems to be a happy term, and we may learn a great deal from them. Independent of all the complications and exactions of the big organizations, burdensome overheads, long periods of inactivity—that seeming necessity of all starting and all finished at once. The independents secure the best story that may be available, as judgment directs, fitting their cast to the story and calling on other resources as needed, when and where they wish, independent of all production restrictions.

Credit Where Due

In recent reviews of "WINGS" critics give credit for its success to its aerial feats and spectacular shots of different kinds which have never before been caught in action by the camera, and rightly give credit to the Paramount organization, Lucien Hubbard, Wm. Wellman and the cast. Now, in all fairness to Harry Perry as chief cinematographer on this production and to the men who co-operated with him, we want to tell their part in making "WINGS" an unusual and interesting picture.

Mr. Perry was engaged for this picture about two months before actual production started, because of his experience in aerial photography and so that he could have time to work out the mechanics necessary to get the effects called for in the script of "WINGS."

Many of these at first sight seemed impossible and he spent days figuring out mounts for cameras to be put in every possible and impossbile place on an airplane and in making tests and working out electrical devices so that they could he operated by the pilot or actor in the air; also mounts for cameras of different makes to be used on different types of airplanes by cameramen themselves.

Mr. Perry also went to Texas twice before the start of production to make tests in the air and help select locations. While on the picture he personally supervised over 200 motor-driven cameras on airplanes, working out the exposures and filters used on each shot before it went into the air and, besides this, the other cinematographers and Mr. Perry had nearly 300 hours of actual work in the air which involved the hardest kind of work, quite a few escapes from serious accidents, which meant no thought of personal safety.

Therefore we believe that the cameramen who actually put the majority of the air scenes in "WINGS" on the film are entitled to their share of the credit for "WINGS'" success, and they are Harry Perry, Burton Steene, Al Williams and Paul Perry.

William Rand, A. S. C., who photographed the Akeley shots in "The Last Command," and "The Street of Sin," is now busy on "The Patriot," an Ernst Lubitsch production also featuring Emil Jannings.

He tells us that Mr. Jannings is fast becoming familiar with the English language. When he arrived in Hollywood his vocabulary was limiited to such expressions as "Good morning" and Thank you." Since most of his directors speak German with ease the balance of the staff began to make Mr. Jannings familiar with English.

Rand reports that he quickly learned such studio phrases as "O. K.," "One hour for lunch," and "All right; 9 o'clock in the morning," and that now, after several months in this country, he speaks English with almost perfect ease.

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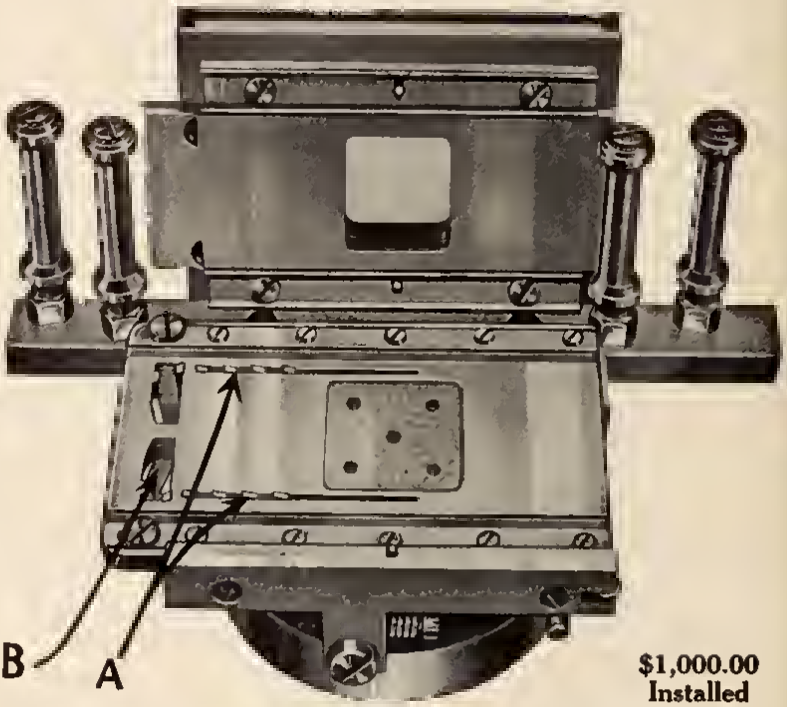

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Light Filters

Their Characteristics and Applications in Photography With Explanatory Diagrams---In Three Parts

By Loyd A. Jones

Of Eastman Research Laboratories. Abridgement of Paper from S. M. P. E. Transactions.

In a previous communication the use of panchromatic film for motion picture purposes was discussed at some length. The fundamental principles involved in the photographic reproduction of the tonal scale, that is brightness and brightness differences, in the case of colored objects were outlined and attention called to some of the advantages arising from the use of panchromatic film for this purpose. The use of light filters was mentioned briefly but no attempt was made to deal with this subject in detail. Since a thorough understanding of the nature of light filters and their use for obtaining a desired effect is essential to the attainment of the best results in the application of panchromatic film to various problems confronting the photographic worker, it seems desirable at this time to present a somewhat more complete and detailed treatment of the subject. Believing firmly in the premise that the nearest approach to perfection in the practice of a science can be attained with greatest facility and certainty through an adequate knowledge of the theoretical aspects of the subject, the first part of this paper will be devoted to a discussion of some of the fundamental principles involved in the use of light filters. In the latter part the more practical phases of the subject will be dealt with and some data relative to the use of light filters will be given.

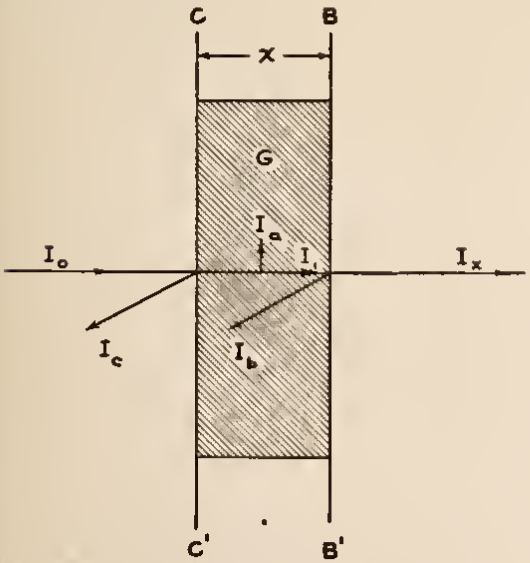

Fig. 1. Diagram illustrating reflection, absorption and transmission.

Fundamental Laws

When radiation falls upon a transmitting material, such as a piece of glass, a part is *reflected* at the first surface, some is *absorbed* within the material, some is *reflected* at the second surface, and the remainder is *transmitted.*

This case is illustrated schematically in Fig. 1, where the shaded area *G*, represents a cross section through a transmitting material, bounded by the parallel surfaces *CC' and BB'*.

I_o represents the radiation falling upon the material; I_c the reflection suffered at the surface *CC'*; I_a the absorption within the material; I_b the reflection suffered at the second surface *BB'* and I_x the transmitted light.

The loss of intensity of radiation that results from the successive reflections and absorptions has been calculated following the Fresnell law of reflection and the results prove that the maximum intensity of light of any wave-length that can be transmitted through a filter having two glass surfaces is only 91.7 per cent of the incident intensity.

This 8 per cent (approximate) loss resulting from the use of a single layer of glass or gelatine is not as a rule serious, but if an attempt is made to obtain some desired result by the use of two or more layers, the loss of intensity due to this reflection at the glass-air or gelatine-air surface may be of consequence.

Absorption of Radiation. The absorption which occurs within a non-turbid transmitting material, follow a logarithmic law in the great majority of cases, including gases, liquids and solids. Thus if a given layer of material absorbs a certain fraction of the radiation, the next layer of the same thickness will absorb the same fraction of that transmitted by the first.

In dealing with solutions used as transmitting materials, the concentration of the solute in grams per unit volume is also to be considered and in the case of dyed gelatine filters, the calculation is carried including the dye concentration expressed in grams per unit area.

Measurements, Graphic Representation and Computation.

To determine quantitatively the absorption of a light filter for radiation of different wave-lengths a spectrophotometer is used. An essential element of this instrument is a device, such as a prism or diffraction grating, for dispersing or separating into its component parts the radiation from some suitable source (such as the electric arc or incandescent lamp) which emits many different wave-lengths. In this way a spectrum is formed and by means of a narrow slit suitably placed, radiation of any desired wave-length may be isolated. One-half of this *monochromatic* radiation is then allowed to fall upon the filter being examined and the intensity of the radiation transmitted by the filter is measured by comparing it in a suitable photometer with the other half of the monochromatic beam which has not been subjected to the absorbing action of the filter. In this way values of transmission, that is to say the ratio of the intensity of the light which is transmitted to that which falls upon the material, for a series of different wave-lengths are obtained.

These values plotted as a function of wave-length, give a curve which shows the absorption characteristics of the filter in graphic form. This is called a *"Spectrophotometric curve."* Such a curve is shown in Fig. 2 applying to a gelatine filter made by the use of Toluidine blue (Filter No. 38 of the Eastman catalogue of Wratten Light Filters).

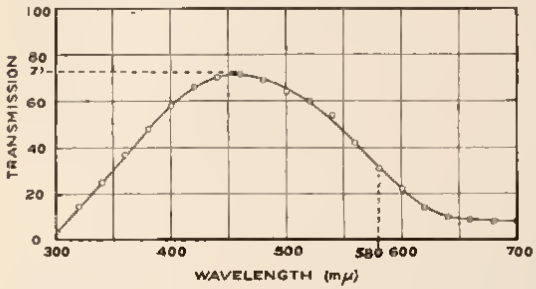

Fig. 2. Spectrophotometric transmission curve of green filter.

In this graph, the abscissa has been divided in as many parts as wave-lengths are to be found between 300 and 700 millimicrons, that is to say the wave-lengths ranging from the acitnic ultra violet to the red visible portion of the Spectrum.

The ordinates indicate the ratio of the light intensity after transmission to that before transmission.

For the Toluidine blue filter, we find that the maximum transmission is approximately at wave-length 460 in the blue region of the spectrum and is equal to approximately 71 per cent of the intensity of the original incident light.

For many purposes, the expression of absorption in terms of optical densities, is more convenient than in terms of transmission. If it is desired to compute the spectral distribution of absorption for two superposed filters, the *"transmission"* values at each wave-length for the two filters must be *multiplied* together, while if *"density"* is used, it is only necessary to *add* the values at corresponding wave-length.

In the case of solids, liquids and gases the *"density"* is directly proportional to the thickness of the transmitting material.

In the case of dyed gelatine, *"density"* is directly proportional to the dye concentration expressed in grams per unit area.

This direct proportionality, of course, applies only to the values of the *"density"* after correction for surface reflection.

Density as computed from transmission measurements made in the usual manner, includes the intensity losses due to surface reflections.

Having determined the densities due to absorption of any wave-length for one thickness of the transmitting material or for the concentration of the dye incorporated in the gelatine filter, the densities due to absorption for any other thickness of the material or any other concentration of the dye, can be computed by simple procedure of multiplication.

In Fig. 3 curve *A*, the spectrophotometric curve for the filter illustrated in Fig. 2, is shown

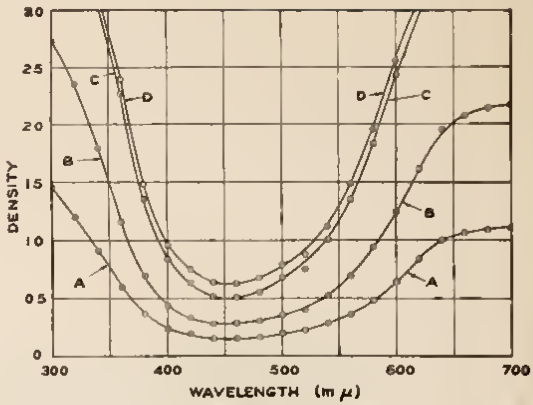

Fig. 3 Spectrophotometric density curves of green filter, illustrating relation between density and concentration and effect of surface reflection.

In plotting the graph, wave-length values are taken as abscissa from wave-length 300 to wave-length 700 as in the spectrophotometric transmission graph (Fig. 2). The *"density"* is expressed by the common logarithm of 1/Transmission, so that a density of one, corresponds to a transmission of 10%, a density of two to a transmission 1% and a desnity of three, to a transmission of 0.1%. The density is plotted as ordinate.

Let us consider, as an example, the transmission of the Toluidine filter in Fig. 2 at wave-length 580.

The spectrophotometric curve of this filter at this wave-length, indicates its transmission to be 0.316, or 316 per 1000. The corresponding density is then given by the logarithm of 1/0.316, i. e., by log 3.16. The tables of logarithm, give us log 3.16, equal 0.4997. In plotting the density graph, the density of this filter for wave-length 580 is then placed at the junction of the abscissa 580 and ordinate 0.4997 as shown in Fig 3.

Densities for other wave-lengths are similarly plotted and the curve *A* in Fig. 3 is finally obtained.

Now, suppose it is desired to determine the effect upon the spectral absorption of increased concentration of the dye used in making the filter. Let the required concentration be 2 and 4 times that represented by curve *A*. Computing the necessary values for various wave-length, taking into account the losses of intensity due to reflections and absorption of the transmitting medium and plotting, the curves *B* and *C* are obtained.

It is interesting to compare the result obtained by increasing the concentration 4 times (curve *C*), with that obtained by using 4 layers of the original film.

This case is represented by curve *D*, the ordinate of which were obtained by multiplying the ordinates of curve *A* by 4.

It will be noted that the minimum density of curve *C* is appreciably less than that of curve *D*, thus the transmission of filter *C* for the wave-length which it transmits most freely is greater than that of filter *D*. The filter obtained by increasing the concentration four times is therefore more efficient from the standpoint of high selectivity in absorption characteristics than that obtained by using four layers of film.

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Novak, Jos. J.—Universal.
Olsen, R. B.—
Ramsey, Ray Lloyd—Universal.
Rand, William—Laaky.
Roberts, Josiah—M.-G.-M.
Shackelford, J. B.—Laaky.
Sickner, William—First National.
Staut, Archie J.—Laaky.
Steene, E. Burton—Caddo Prod.—Met. Studio.

NEWS CINEMATOGRAPHERS

Grimes, William H.—M.-G.-M.
Parriah, Fred—Fox, Colorado Springs.
Staub, Ralph B.—Columbia, Specialties.

STILL PHOTOGRAPHERS

Alexander, Kenneth—United Artists—D. W. Griffith.
Archer, Fred R.—De Mille.
Fryer, Elmer—De Mille.
Kahle, Alexander—De Mille
Mannatt, Clifford—M.-G.-M.
Parker, Robt. M.—Stull Prod.
Richee, Eugene Robert—Laaky.
Rowley, Lee—Laaky.
Stapp, W. B.—
Sigurdson, Oliver—Metropolitan Studio.
Thomas, Wm. E.—De Mille.
Van Roasem, Walter J.—James Cruse, Inc., Met. Studio.

SECOND CINEMATOGRAPHERS

Bader, Walter S.—M.-G.-M.
Bauder, Steve L.—M.-G.-M.
Baxter, George—De Mille.
Bennett, Monroe—
Borradaile, O. H.—Laaky.
Ckaney, George—United Artists.
Chewning, Wallace D.—M.-G.-M.
Cunliffe, Donald—Universal.
Davis, Leland E.—
Doolittle, Jas. N.—First National.
Drougkt, Jas B.—Universal.
Dunn, Linwood G.—Metropolitan Studios.
Dyer, Edwin L.—
Fitzgerald, Edward—M.-G.-M.
Giridhan, Jas N.—F. B. O.
Greene, Al M.—Technical Art.
Greenhalgh, Jack—F. B. O.
Guffy, G. Burnett—De Mille.
Haas, Walter—
Harten, Charles—New York.
Head Gordon G.—
Hendrickson, Fred S.—Laaky.
Huggins, L. Owens—
Jenkins, John—
Julian, Mac—
Keyes, Donald B.—
Landrigan, John S.—Laaky.
Lang, Charles Bryant—Laaky.
Longet, Gaston—F. B. O.
Lanning, Reggie—Laaky.
La Shelle, Joe—
Laazlo, Ernest—
Lindon, Curly—
Martin, Robt. G.—F. B. O.
Marta, Jack A.—Fox.
Merland, Harry—Laaky.
Mola, Pierre M.—M.-G.-M.
MacLean, Gordon—M.-G.-M.
Nogle, Geo. G.—
Pahle, Ted—
Palmer, Robt—M.-G.-M.
Parsons, Harry—
Pittack, R. W.—Laaky.
Planck, Bohl. H.—Columbia.
Prince, Al—Universal.
Pyle, Edwin L.—
Ragin, David—Fox.
Ray, Bernard B.—
Redman, Frank—DeMille.
Reed, Artkur—M.-G.-M.
Reea, Wm. A.—Fine Arts.
Schmitz, John J.—Special Process.
Schopp, Herman—Metropolitan Studios.
Shepek, John, Jr.—Educational.
Silver, John—
Smith, Jean C.—De Mille.
Stine, Harold E.—De Mille.
Tappenbeck, Hatto—Fox.
Trezo, Fred—Universal.
Thompson, John—F. O. B.
Unholz, George—Sennett.
Van Dyke, Herbert—M.-G.-M.
Van Enger, Willard—Warner Bros. Vitaphone.
Wagner, Robt—First National.
Walters, Joseph J.—F. B. O.
Weatherby, Fred—De Mille.
Wilde, Harry—
Williams, Alfred E.—Laaky.
Rex, Wimpy—Laaky.
Witzel, E. L.—Universal.

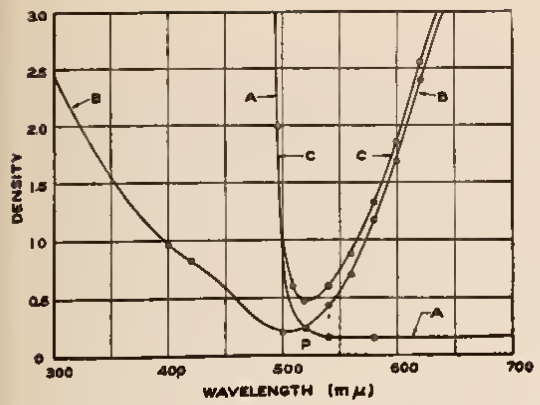


Fig. 4. Spectrophotometric density curves of "A" red filter, "B" green filter, and "C" the green filter obtained by superposing "A" and "B."

The expression of the data in the form of density is also most convenient where it is desired to compute the spectral absorption obtainable by the superposition of two or more filters or the use of two or more dyes in the same solution or gelatine film. In the case of the superposition of the two sheets of dyed gelatine or pieces of glass it is only necessary to add at each wave-length the density values as determined directly by the spectrophotometer. In case the addition is to be made by incorporating two dyes in the same solution or in the same sheet of gelatine it is apparent that the appropriate correction must be made for any surface reflection factor which may be included in the density values for the individual dye components. In Fig. 4, curve *A*, is shown the spectrophotometric density curve of a yellow (blue absorbing) gelatine filter. Curve *B* shows the same characteristic for a blue-green (red absorbing) gelatine filter. Curve *C* is that obtained by adding the ordinates of *A* and *B* and shows the spectral absorption obtained by the superposition of one layer of each filter. Curves *A* and *B* intersect at the point *p* of which the density value is 0.25 (transmission=56.4%). The density of the superposed combination, curve *C*, at the corresponding wave-length is two times 0.25 or 0.50 (transmission=32%). This is the

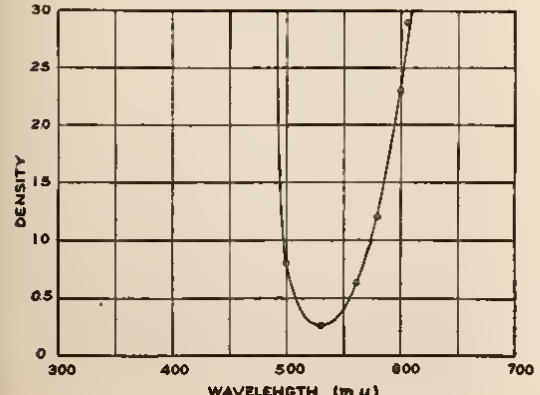


Fig. 5. Spectrophotometric density of curve of "sharp cut" green filter.

minimum density value of *C*. Hence at the wave-length which is transmitted most freely by the combination only 32 per cent of the incident radiation is transmitted. This compound filter (curve *C*) is bright green in color and isolates fairly well the wave-length band from 500 to 600mμ. A filter of much greater efficiency for this purpose can be made by incorporating properly selected dyes in a gelatine film. Such a filter is illustrated by the curve in Fig. 5. This has maximum transmission at approximately the same wave-length as *C* (Fig. 4) and its density value is approximately 0.25, corresponding to a transmission of 54 per cent, almost twice that of filter *C*.

A similar low efficiency is usually encountered to a greater or lesser extent whenever an attempt is made to isolate some particular spectral region by superposing two or more separate filters. This is due in part to the increasing loss in surface reflections as the number of separate filters is increased. Furthermore each filter is designed by the manufacturer to give some specific spectral absorption with maximum efficiency and to this end the best possible available dyes are selected. If some entirely

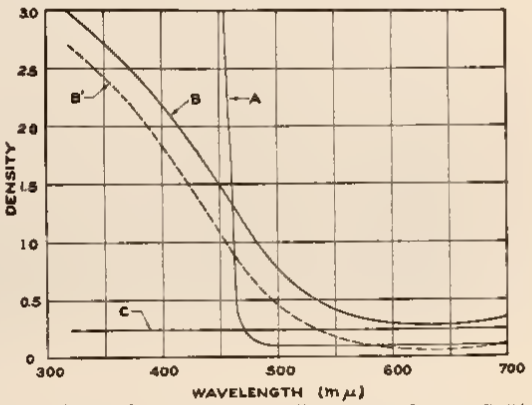


Fig. 6. Spectrophotometric curves illustrating "sharp cut" "A," gradual cut "inefficient" filter "B," and gradual cut efficient filter "B'."

different spectral absorption is required it is probable that dyes can be selected which will function with greater efficiency than can be obtained by combining two filters designed specifically to meet other requirements.

The terms "sharp cut" and "gradual cut" are frequently applied as descriptive of light filters. The significance of these terms may be illustrated by reference to Fig. 6. Curve *A* is the spectrophotometric curve of a brilliant yellow gelatine filter. Its density at all wavelengths greater than 480mμ is 0.1 (transmission=86%). The absorption at wave-lengths less and 480 mμ increases rapidly so that at 460mμ its density is 1.5 (transmission =3.1%). Such a filter is described as a "sharp cut" filter. It is evident therefore that the term "sharp cut" applies to a filter of which the absorption curve is steep, that is the rate of change of absorption with variation in wave-length is great, or conversely the condition described as "sharp cut" applies to the case where a relatively small change in wave-length is accompanied by a large change in absorption.

Curve *B* applies to a piece of *amber* glass and to such a filter the descriptive term "gradual cut" is applied. It will be noted that the wave-length band over which the change from its minimum to maximum density occurs is very broad, extending from 600 mμ to 300 mμ

(Continued on Page 26)

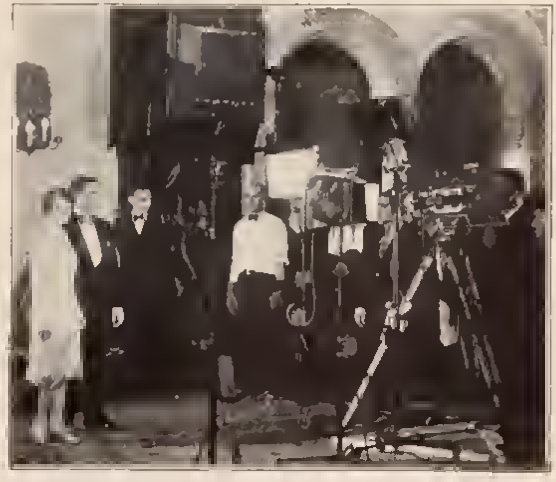
Aerial photograph shot by First Lieutenant Willis R. Taylor, commanding officer of the Fifteenth Photo Section, U. S. A., Crissy Field, California.

Standing—James, of the General Electric Company; Peter Mole and J. M. Richardson, of Mole-Richardson; Electrical Engineer F. N. Murphy, of Warner Brothers. . Seated—Farnham, Van Horn and L. C. Porter, General Electric Company.

The Research Club of Paramount-Lasky Studi

Set at Warner Brothers' Studio used in the incandescent light tests now making under the direction of the Academy of Motion Picture Arts and Sciences and American Society of Cinematographers. The ceiling of this beautiful set is painted on glass and the light is from incandescent sources. The set has been used by all members of the A. S. C participating in the demonstrations.

ed of employees of the electrical department.



Gaetano Gaudio, A. S. C., directing incandescent light tests in the Roosevelt Hotel lobby, Hollywood; Donald Keyes, A. S. C., assisting.

The S. M. P. E.

(Continued from Page 5)

Los Angeles, Calif.; George A. Mitchell, Mitchell Camera Co., 6025 Santa Monica boulevard, Hollywood, Cal.; Otto K. Olesen, 1645 Hudson avenue, Hollywood, Cal.; M. W. Palmer, Famous-Players Lasky Corporation, Long Island City, N. Y.; Roy J. Pomeroy, Famous-Players-Lasky Studio, 5451 Marathon, Hollywood, Cal.; W. R. Rothacker, First National Studios, Burbank, Cal.; Wm. Sistrom, Cecil B. De Mille Studio, Culver City, Cal.; A. George Volck, Cecil B. De Mille Studio, Culver City., Cal.; C. A. Willat, 1803½ Gower street, Hollywood, Cal.· Alvin A. Wyckoff, American Society of Cinematographers, 1220 Guaranty building, Hollywood, Cal.

Following is a list of the organizations represented in the S. M. P. E.:

The American Society of Cinematographers; Motion Picture News, Inc., Alexander Film Co., Rothacker Aller Lab., Province of Ontario Pictures, Technicolor M. P. Corp., American Photography, Sperry Gyroscope Co., Rothacker Film Mfg., Co., Kiddle & Morgeson, Eastman Kodak Co., Brenkert Light Projection Co., Atlantic Belatin Co., Griffin & Bowen, Inc., Bristol Company, Edison Lamp Works, Westinghouse Electric & Mfg. Co., Duplex M. P. Industry, Inc., Carpenter-Goldman Lab., Pathe Exchange, Akeley Camera, Inc., Eastman Theater, Kodascope Libraries, Inc., National Carbon Co., Pathe-Dupont De Nemours Co., Cummings Laboratory, Government Motion Pictures, Prechistenka Ohulkov (Russia), Spencer Lens Co., Pathescope Co. of Canada, Ltd., Westinghouse Lamp Co., Helios Corp., Bay State Film Co., American Projectionist, National Lamp Works, John O. Elms, Famous Players, Lasky Corp., Trumbull Amusement Co. of St. Petersburg, Ford Motor Co. of Canada, National Theater Supply Co., Celluloid Co. of Newark, E. E. Fulton Co., Corning Glass Work, Gaumont Co. Gundlach Manhattan Optical Co., Orpheum Theater, International Projector Corp., Gregory, Carl Louis, General Electric Co., Consolidated Film Lab., Hertner Electric Co., Duplex Motion Picture Industries, U. S. Army M. P. Service, Kiddle & Morgeson, Bell & Howell Co., Erbograph Co., Cooper-Hewitt Electric Co., Herbert & Huesgen, Marcus Loew, Inc., F. E. Ives, Francis C. Jenkins, Daylight Film Corp, Bausch & Lomb Optical Co., Fox Film Corp., Kelley Color Films, Keuffel-Esser Co., Lang Mfg. Works, Pathescope of Canada, J. E. McAuley Mfg. Co., Electrical Testing Lab., Matlack Corp., E. J. Electric Installation Co., Technique de Pathe Cinema, E. Leitz, Inc., Chicago Film Laboratory, Mitchell Camera Co., National Cash Register Co., Bray Productions, Associated Screen News, Dept. of Trade & Commerce, Perfection Arc Co., Southern Enterprises, Inc., Warner Research Lab., Caribbean Film Co., M. P. Producers & Distributors of America, Raven Screen Co., Ilford, Ltd., Moving Picture World, Pathe of France, Ltd., Kodak Co., Cine Dept., Cecil B. De Mille Studio, Akeley Camera Co., Case Research Lab., Colorat Studio, Ansco Co., Urban-Kineto Corporation, Victor Animatograph Co., Ward Cine Lab., Inc., Williamson Manufacturing Co., Ltd., Famous Players-Lasky Corp.

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Question—How did Panchromatic film originate?

Answer—The question is quite timely and the interest that it will undoubtedly arouse prompts the Answerman to devote to its answer all the space allotted to this department.

In the year 1873 the German scientist and investigator, H. M. Vogel, was conducting a series of experiments in order to find a way to eliminate the halation caused by rays of light reflected back to the sensitive emulsion by the glass supporting it. He thought that by incorporating a dye in the sensitive collodion in use in those days he could reduce such halation without destroying the sensitiveness of the plate.

During his experiments he noticed that a change in the sensitivity of the emulsion was noticeable. With the use of CORALLIN the yellow rays were rendered more actinic than they were with the ordinary emulsion.

This led him to investigate the properties of a number of dyes and he discovered that the emulsions were rendered MORE SENSITIVE TO THE LIGHT ABSORBED BY THE DYE ITSELF. Corallin, for instance, absorbs the yellow-green rays and the sensitivity of the emulsion to these rays was increased when the dye was incorporated into the emulsion or applied by a soaking of the ordinary plate in a weak solution of the dye.

CYANIN was one of the dyes experimented upon by Vogel.

Plates thus prepared were named ORTHOCHROMATIC from the Greek ORTHO, meaning "correct," and CHROMOS "color."

This appellation was quite incorrect because the dyes known in those days did not correct the color rendition throughout the spectrum and a new word, PANCHROMATIC, had to be coined when such correction was found to be possible.

In 1882 the French chemist, Attout Tailfer, introduced the use of EOSIN and ERYTROSIN in conjunction with ammonia which rendered the plates more sensitive to the yellows and yellow-greens.

In 1884 Vogel brought the sensitivity of the emulsion into the Orange-yellow region by the use of QUINOLINE and also preconized the mixture of different dyes such as QUINOLINE RED and CYANIN, to which he gave the name of "AZALINE PLATES." Vogel also discovered that Eosin had the strongest effect when used in the form of its silver salts dissolved in Ammonia.

In 1881 HIGGS orthochromatized plates with ALIZARIN BLUE and COERULIN, which rendered them sensitive to the yellow, orange the red regions of the spectrum. Higgs used the plates so prepared in photographing the solar spectrum.

In 1904 E. KOENIG produced the dyes known under the commercial name of ORTHOCHROM T, PINAVERDOL and PINACHROME which, used with the silver bromide emulsions, extend the sensitivity in the reds but more so in the oranges and greens. In the same year MIETHE and TRAUBE found that ETHYL RED was more suitable than cyanin, being more stable and consequently avoiding trouble and deterioration of the sensitized plates.

HOMOLKA, in 1906, discovered PINACYANOL, a red sensitizer, which in conjunction with a green sensitizer such as Pinachrome or Pinaverdol, would sensitize an emulsion TO THE WHOLE OF THE VISIBLE SPECTRUM.

Panchromatic emulsions were thus born.

Due to the conditions created by the world war the United States increased their contribution to the question and POPE prepared dyes identical with the dyes which were up to this time prepared only by German manufacturers.

MECCERS and McCLELLAN succeeded in photographing the infra red regions with DICYANINE, reaching as far as wave length 10,140.

ADAMS and HALLE, in 1919, discovered KRIPTOCYANIN, producing a strong sensitivity in the infra red region and, in 1925, H. T. CLARKE, of the Eastman Kodak Laboratories, discovered NEOCYANIN, which gave remarkable results for its sensitiveness in the infra red regions, reaching as far as wave length 11,290.

Professor Wright, of the Lick Observatory, and Dr. Mees, of the Eastman Kodak Company, proved the penetration through atmospheric haze of plates sensitized with KRIPTOCYANIN or NEOCYANIN.

This brief outline of the history of Panchromatic emulsions does not give the least idea of the tremendous amount of work conducted in these investigations and of the difficulties that have been overcome to bring about Panchromatic materials presenting the conditions of uniformity and stability required to make such material a commercial success.

Virgil E. Miller, A. S. C., has signed a long term contract with the F. B. O. studios, after completing a picture directed by Dudley Murphy, in which "Skeets" Gallagher, Ruth Dwyer, Albert Conti and Patricia Avery were featured. The first picture to be made under the new contract will also be directed by Mr. Murphy. Its working title will be "Stocks and Blondes."

WM. RAND

AKELEY SPECIALIST

Akeley work on the following productions:

"Barbed Wire"—(Pola Negri).
"Woman on Trial"—(Pola Negri).
"Swim, Girl, Swim"—(Bebe Daniels).
"Underworld"—(Geo. Bancroft).
"Street of Sin"—(Emil Jannings).
"The Last Command"—(Emil Janninga).
"The Patriot"—Current Emil Jannings production being directed by Ernst Lubitsch.

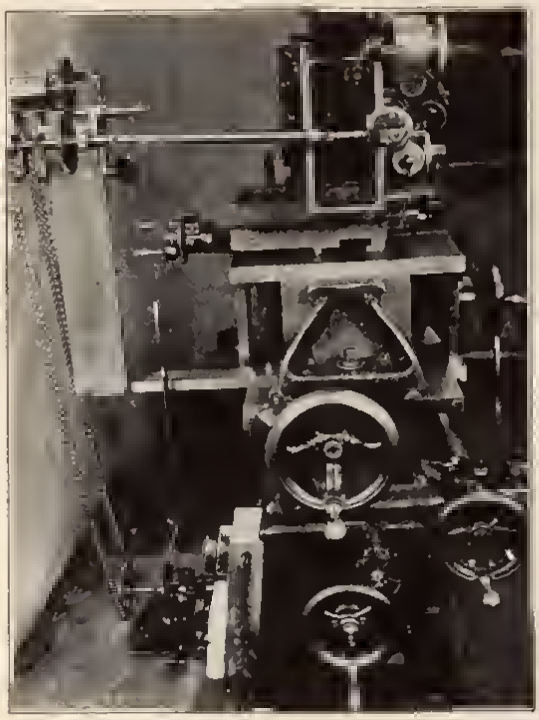
For Trick Work

By Hereford Tynes Cowling

(Continued from Page 7)

Invaluable for Animated Cartoons

With the development of the art of cartooning and of camera trick the optical printer came into use again as an ideal instrument for selecting from films already made, the components desired for the construction of composite or "trick" pictures, and for the recombining of these components into pictures. Most "trick" work and nearly all animation consists of an assembly or composite of time and action components. In animation the components are painstakingly drawn by hand and snythesized by photographing them in the proper sequence with a motion camera.



No. 3—Control end of Barber Optical Printer, showing wheels and levers which move and operate all parts of the machine from one controlling position

New Life for Old Subjects

The requisite components for an infinite variety of new combinations exists in every small collection of photographically produced motion picture film, but to select these components from hundreds or thousands of film pictures, each no larger than a postage stamp, seems too staggering to attempt. This selection is only a half of the problem, for the components must then be reassembled with mathematical precision so fine that the new combination shall not reveal the joining lines between the welded parts even when maganified hundreds of diameters on the screen. The solution of this difficult problem is in a precision optical printer where every mechanical move can be controlled with micrometric precision.

Not a Secret

There is nothing secret about the principles of optical printing. They are known to every motion picture technician. A number of optical printers have been constructed for exclusive or private use and the details of their mechanical design have been kept more or less in seclusion. Realizing that there are many firms and individuals who have use for the product of such a machine and that the very few elaborate optical printers in existence are being kept for exclusive purposes, Mr. Fred A. Barber has constructed one of these instruments for the service of the public. Mr. Barber has put several years of time and experience into the design and construction of this precision instrument. He is a cinematographer and technical expert. His work as a specialist in the less known branches of cinematography have kept him in the laboratories and studios of companies which do only special and scientific work of difficult character. He is now associated with Carl Louis Gregory, in whose laboratory this machine is being operated.

Precision First Requisite

The base of the machine is a heavy six-foot lathe bed set on a concrete foundation. Sliding on the lathe bed which acts as an optical bench are three heads. The operator sits at one end of the machine where all of the controls ordinarily used are situated. On the head nearest the operator is a Bell & Howell camera with special magazines which take up automatically either backward or forward.

The second head has an interchangeable mount and takes any lens fitted for the Bell & Howell cameras. The third head carries a special projection head movement and lamphouse. All the heads may be shifted up and down or sideways and micrometer indicators reading in plain figures to one-eight-hundredth of an inch show the exact position of each member. A motor beneath the machine permits either head to run independent of the other and either head may run backward or forward. Several interchangeable mechanisms may be used on the different heads for different purposes, including enlarging from and reducing to 16 mm. size film.

Has Many Uses

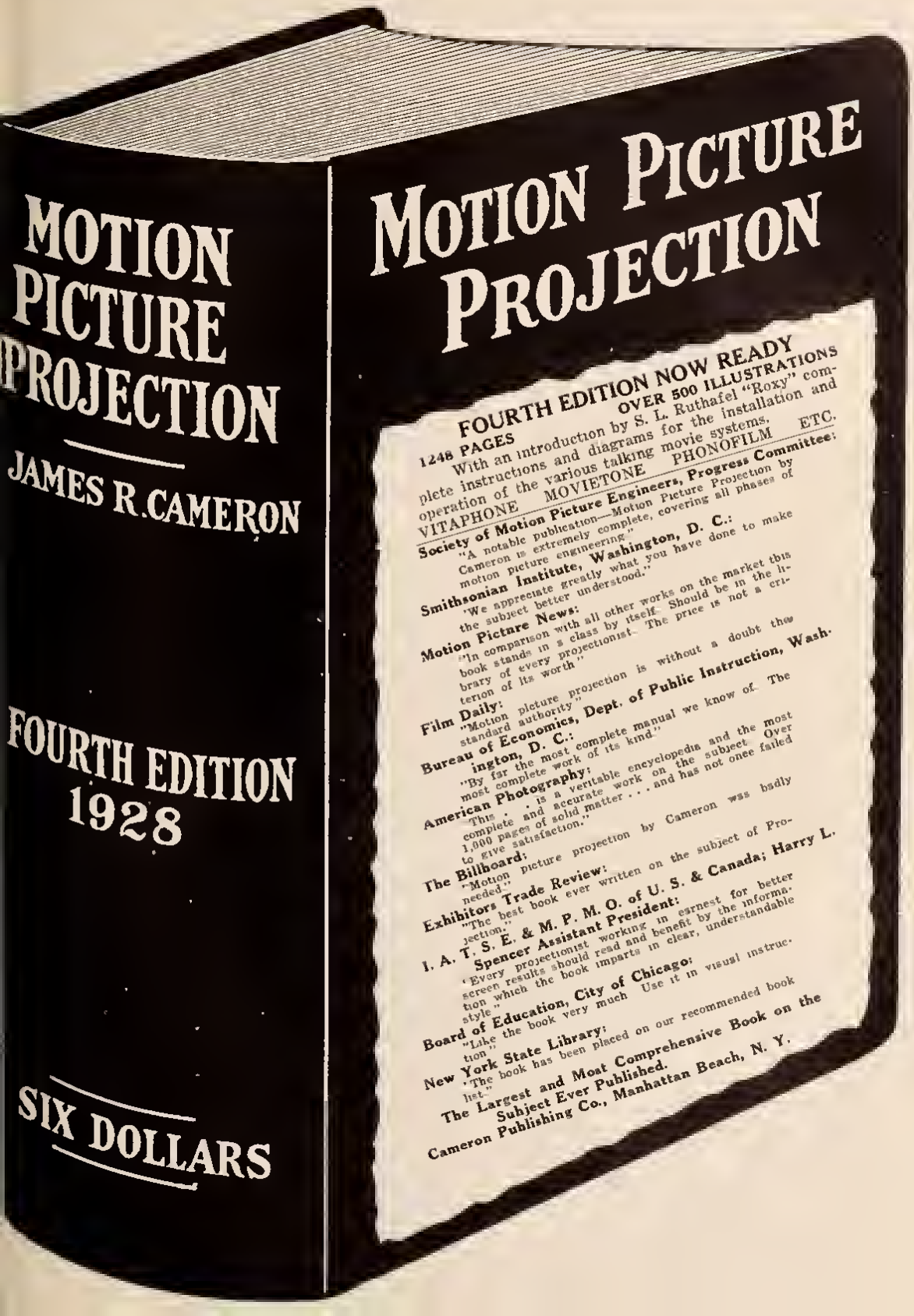
So many different things can be done with this machine that it is not possible to list them here. Listed below are some of the principal things which can be done with it:—

1—Duplicate negatives which cannot be distinguished from original as no printer marks show on these negatives.

2—Changing frame line. Duplicate negatives can be made from non-standard negatives or prints and the frame line changed to coincide with any other standard.

3—Combining two or more negatives upon one film so that normal and ultra-speed may be shown side by side or a vision may be made from one negative and introduced into any other negative.

4—Negatives can be reproduced with the action slowed down or quickened to almost any extent. Normal action can be made from ultra-speed, thus giving normal and ultra-speed action from exactly the same view point.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HOllywood 4366

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Free Lance Akeley Specialist
Phone: WH. 3920

5—Hold action at any point. Action can be suspended and held still at any point in the film and then be continued or reversed or repeated. Very valuable for golf instruction films or for instruction in any other sport or for showing the action of machinery.

6—Reserve action. Any negative can be reversed to show the action backward, and this action can be slowed down or speeded up if desired.

7—Repeat action. Action can be repeated as many times as is required, and at the same time, reversed or the speed changed to suit any purpose.

8—Camera effects. All kinds of camera effects, such as: fade-in, fade,out, iris-in, iris-out, lap dissolves of any length or any other camera effect can be introduced onto negatives already taken.

9—Duplicate or multiple action of the same subject in the same scene. This can be in synchronism or different phases of the same action may be shown going on at the same time.

10—Double and multiple exposures from any number of original negatives in absolute register.

11—Super-imposed titles may be made in any portion of a negative which has already been taken and developed.

12—Borders, frames and masks may be introduced around any scene.

13—Close-ups can be made from semi-close-ups. Any part of any negative already taken can be enlarged or reduced.

14—Trucking shots. The effect of moving up on a scene for a closer view or of moving back to include more of the scene can be made from any negative already taken.

15—X-Ray views of machinery or any object in motion can be made showing both exterior and interior as if the machine were transparent.

16—Explanatory labels, animated lines, pointers, etc., can be introduced into negatives already made.

The effects enumerated above do not by any means tell all of the things which can be done by the various possible manipulations of the machine. The various combinations possible are limited only by the ingenuity of the operator and the film material which he has available for reproducing ideas.

With the ever-increasing demand to insure preservation of old film subjects of historical, scientific and other interest by duplicating processes; as well as to combine these features of past events within new productions; the development of this especially designed machine will meet a long-felt want. Mr. Barber is to be congratulated upon the ingenious labor he has given this subject.

R. G. Martin, A. S. C., formerly with M.-G.-M., has moved his equipment to the F. B. O. where he has just finished "Crooks Can't Win," starring Ralph Ince. He is now working on another opus with the same star.

Joe Dubray, A. S. C., has just finished making an extensive series of tests on Panchromatic emulsions. The Agfa sponsored these tests and Joe announces that he is gathering some data which will be very valuable to the members of the A. S. C.

Movie Make-Up

By JOSEPH DUBRAY

(Continued from Page 8)

tive film under conditions controlled by a lens. This photo-chemical action is not, even with Panchromatic emulsions, a perfect rendition of the impressions made by the same object on the human eye.

If the object be a human face, which is the case that interests us, the power of the reflected light that concurs to form the image on the films, varies considerably from subject to subject and still more considerable are the differences of its effects upon the sensitive film, the response of the film, in other words, to the reflected light.

Suppose, for instance (that which never exists in real life), two ideally perfect complexions, say of a young girl and a young man which to all appearances would need no make-up at all for a perfect photographic rendition.

Taken individually the photographic results on the screen would be as perfect as may be desired, but if you put them together in the same picture, in the same scene, in a close-up, for instance, of the two heads, you would immediately notice that difference of response that is mentioned in the preceding paragraph.

All the ingenuity, all the artistry of the cinematographer is then called into play to balance his lightings so as to overcome the differences of actinic value of the two subjects.

And if the two subjects are not perfect, photographically perfect, so to speak; if their complexions are quite different in reflecting power in respect to the film, and if one of the subjects (and this is the condition that too often presents itself) wears make-up and the other none—well—it is then more than unjust to expect the cinematographer to perform the impossible feat of obtaining a well-balanced, perfect rendition of values, and the result then is bitter criticism, poor screen rendition, disillusionment, heart-ache and perhaps ill-feeling.

And if we consider the psychology of photography in regard to the dramatic values of a picture we may wonder how the beautiful heroine can sacrifice herself, the affections of her family, perhaps the love of her children, for the love of a hero of fine figure and lineaments but afflicted with a dirty, greasy looking face?

No matter how fine the performance the physical repellance reacts upon the audience to the detriment of the success which would be the reward of hard work, of sincere effort.

Make-up is the *controllable agent* that permits the abolition of these evils.

Some actors claim that make-up hampers their freedom of action and expression.

Let us be frank and unbiased. Make-up is a vital necessity in the making of motion pictures, it is a tool belonging to the trade of acting, and a very delicate tool requiring a great deal of study and experience in its use, study and experience which will minimize its possibly unpleasant features.

A man who has chosen the trade of carpentering has to accept the noise of the hammer hitting upon a nail no matter how unpleasantly the noise may offend his ears

The artist painter accepts the odors of paint and varnishes.

The violinist can express his artistry in spite of the callouses that grow at the tips of his fingers.

And hammer and nails, paints and varnishes and pressure of the fingers upon the violin strings are as essential to these arts as make-up is to the motion picture performer.

IS MAKE-UP TO BE OR NOT TO BE?

FRANK ZUCKER, A. S. C.

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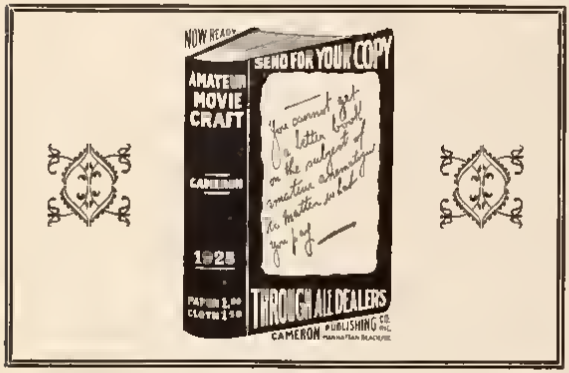


Light Filters

By LOYD A. JONES

(Continued from Page 71)

The slope of the absorption curve in this region of variable adsorption is low and hence the filter is described as one having a "gradual cut." The transmission of this filter for the wave-length it transmits most freely is very low, being approximately 50 per cent (density=0.3) in the region from 600 to 800 mμ. Filter *A* has a bright yellow color, while *B* has a hue slightly more orange and exhibits a dull "muddy" appearance. This term "muddy" is also used frequently as descriptive of light filters and indicates a relatively high general absorption for all wave-lengths in the visible region. The muddy appearance may be considered as due to an admixture of black in the filter. For instance let the dotted curve *B'* represent a filter having an absorption curve similar in shape to that of *B* but for which the density at all wave-lengths is .24 less than that of *B*. The maximum transmission of *B'*, in the wave-length band from 600 to 690 mμ, is 90 per cent and such a filter has a clean brilliant appearance although the dominant wave-length is somewhat longer than in the case of filter *A* thus giving filter *B'* a hue which is more orange. Now suppose that to this filter (curve *B'*) is added a black dye, represented by curve *C* of such concentration as to give a density of 0.24 at all wave-lengths. The addition of *C* to *B'* gives *B*, and the *B'* filter is changed thereby from a clear brilliant yellow-orange to a dull "muddy" amber. "Muddiness" in a filter is therefore due to something equivalent to the addition of a black component and is an indication of high absorption in the wave-length region of maximum transmission and hence of low optical efficiency.

(To Be Continued in April)

Wm R Howard and his A. S. C. camera crew at De Mille studio directing 'His Country" for Pathe release Left to right Chief Cinematographer Lucian Andriot, who has shot all of Howard's pictures Back of Andriot is Harold Stine, associate cinematographer The weird contraption is the $10,000 electrical camera carriage Elmer Fryer, company, still photographer, is also an A. S. C.

The P. A. of A.

Following is the program of the Forty-sixth Annual Convention of the Photographers' Association of America, to be held at Louisville, Kentucky, beginning Tuesday, March 27, 1928:

TUESDAY, MARCH 27

10:30 A M.—Opening of Manufacturers' Exhibit
1:30 to 2:00 P. M.—Community Singing.
2.00 P. M.—Convention called to order by Chairman of Convention Committee
Singing of National Anthem.
Singing of British Anthem.
Address of Welcome
Response
Chairman of Convention Committee turns gavel over to President Townsend
Annual Address of President.
Report of Treasurer.
Report of Secretary.
Report of Chairman of Commercial Section.
Report of Director of P. A. of A. School of Photography
Report of Woman's Auxiliary
Report of Advertising Committee.
Report of Constitutional Committee.
Appointment of Committees.
General Business.
Introduction of Richard Speaght
Address of Richard Speaght
Tuesday Afternoon—Richard Speaght

WEDNESDAY, MARCH 28

Wednesday Morning
10:00 to 11:00 A. M.—I. T. Frary, Cleveland, Ohio, "Studio Decoration and Arrangement."
11:00 to 12:00 Noon—Open
Wednesday Afternoon
2:00 to 3:00 P. M.—James Elliott, Underwood and Underwood. New York city, "Are You Charging Enough for Your Work?"
3:00 to 4:00 P. M.—George Harris, Washington, D. C., "National Advertising."
Fred Millis, Indianapolis, Indiana, "National Advertising."

THURSDAY, MARCH 29

Thursday Morning
10:00 to 10:40 A. M.—Dave Merriam, Minneapolis, Minn., "Photo Finishing as a Side Line."
10:40 to 11:20 A. M.—James Thompson, Knoxville, Tenn., "Commercial Photography in the Smaller Cities."
11:20 to 12:00 Noon—Art Director
Thursday Afternoon
2:00 to 2:45 P. M.—L. W. Rand, Brockton, Mass., "System in the Studio."
2:45 to 3:10 P. M.—Pirie MacDonald, New York, N. Y., "Photography and Its Importance."
3:00 to 4:00 P. M.—Richard Speaght.

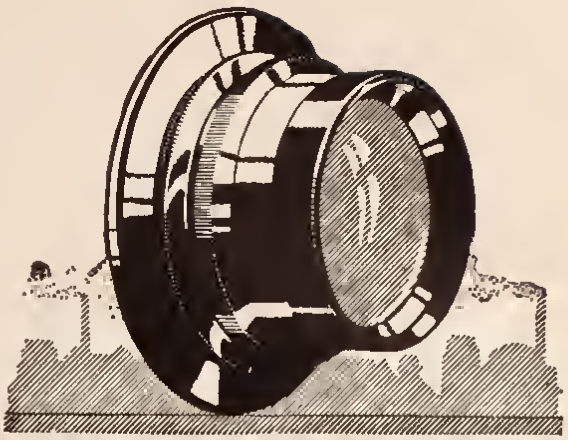
FRIDAY, MARCH 30

Friday Morning
9:45 to 10:45 A. M.—Business Session
10:45 to 11:15 A. M.—Clarence Stearns, Rochester, Minn., "Personality."
11:45 to 12:00 Noon—Robert Young, San Francisco, California, "Commercial Demonstration."
Friday Afternoon
2:00 to 3:00 P. M.—Professors Bussey and Barton, New York, New York, "Principals of Salesmanship."
3:00 to 4:00 P. M.—Delegate from American Society of Cinematographers.
Friday Evening
Banquet

Advantages of the A. S. C. in the P. A. of A.

I. The Use of Travelling Exhibits.
   a. Five Portrait Exhibits.
   b. Three Commercial Exhibits
II. The Use of Standard Forms
   a. Copyright publication release.
   b. Model release for publication and copyright.
   c. Affidavit form for photographers taken for legal purposes
   d. Cost forms for Commercial Photographers
   e. Cost forms for Portrait Photographers.
   (The above are all in preparation)
III. The Commercial Photographic Service of the P. A. of A.
   a. A service whereby manufacturers can go to their local photographer and have work done in different cities all over the United States and Canada through members of the Commercial Section
IV. The Winona School.
   a. Portrait Department.
   b. Commercial Department.
V. The Speakers Bureau.
   a. A service whereby the 80 or 90 clubs throughout the country can secure the services of 50 or more of the leading photographers in the country to address their meetings
VI. Business Counsellor.
   a. A service whereby the clubs throughout the country can get the services of an experienced advertising man who will advise them on the Advertising Campaign, the tie-up material, and the various services that the Association has to offer. Services of this man will be free to all clubs.

(Continued on Next Page)



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A Bit of History

A local periodical published not long ago a story by a United Press staff correspondent concerning the bringing to light of a French film.

Some errors of dates appeared in this yarn and in the spirit of impartiality the *American Cinematographer* publishes the following bit of history.

As far back as 1885 celluloid strips were coated with sensitive emulsions. In 1887 Hannibal Goodwin, of New Jersey, and Graff and Jougla, of France, manufactured photographic films. In 1888 Blair furnished Edison with celluloid films for his experiments and in 1889 the Eastman Kodak Company was manufacturing such material.

In 1894 the Lumiere Brothers of Lyons, France, organized the manufacture of sensitive films and in 1896 their manufacture of negative and positive films had reached a high degree of perfection.

The FIRST showing of PROJECTED motion pictures, which included "The Arrival of a Train in a Depot," "A Boat Leaving Port," etc., took place at a private showing March 1st, 1895, followed by other private exhibitions to photographic and scientific societies, on June 10, 1895, June 12, July 11, November 10 and November 16 of the same year.

The first PUBLIC exhibition took place in the Indian Room in the basement of the "Grand Cafe" in Paris, the evening of Saturday, December 28, 1895. The program was composed of ten pictures of a length of about 45 feet each.

Previous to this exhibition, the only motion pictures in existence (besides the little books composed of series of pictures, viewed by rapidly revolving the pages with the thumb of the hand that was holding the book) were the Edison "Kinetoscope," a *peep-hole* apparatus through which the cine-photographic film was viewed by one person at a time. The Kinetoscope when exhibited in Paris in 1894 spurred Mss. Lumiere in their researches on the taking and *projecting* of motion pictures.

The first projected pictures in America using Edison's Kinetoscope films, were shown to Mr. Edison in December, 1895, by Mr. Armat, of Washington, D. C., the inventor of the projector, in the offices of Raff & Gammon, in the Postal Telegraph building, 253 Broadway, New York city.

The Lumiere Brothers did not exploit their invention, their occupation being the manufacture of medical and photographic chemicals as well as sensitive plates, films and papers, one of the most flourishing industries in the world.

The exploitation of the Cinematographer was conducted by pioneer producers such as Mr. Charles Pathe, whose establishments led the motion picture world, until the world war occasioned a complete stop to activities in Europe.

The P. A. of A.

(Continued from Page 27)

VII. The Benefit of the National Advertising in over a dozen prominent magazines
VIII. A Subscription to the Pathfinder
IX. The use of Syndicate Form Letters and Direct Mail Literature.
X. The use of Syndicate Street Car Cards.
XI. The use of Syndicate Newspaper Advertisements.
XII The use of Syndicate Bill Board Advertisements.
XIII The National Convention.
XIV Decalcomanias and Electrotypes of our Association Emblem.
XV. Fellowship Degree.

A Letter from Cooper Hewitt

The American Cinematographer is permitted to reproduce the following excerpts from an interesting letter recently received from the Cooper Hewitt Company by that organization's local representative, Mr. John T. Shannon:

* * * "It has never been the writer's idea that any one particular kind of form of light could ever be developed so that this particular form of light would be an all-purpose light. In other words, the writer's experience has caused him to believe that the mixture of two or more different types of lighting varying in quality and in kind give the cinematographer not only a great leeway in achieving the particular results for which he is striving, but this mixture of two kinds or qualities of light allows him to obtain certain artistic values which could not be obtained by the use of any one kind of light.

* * * "About two years ago the writer, having a knowledge of the qualities and the benefits to be derived from the use of Panchromatic film, and while at our factory in June, 1926, went into the matter with our engineering and construction departments regarding the possible manufacture of a tube using a new principle at that time, so that we could be able to supply to the cinematographers a combination of tubes each giving light emanations of such character as to obtain the greatest actinic value at either end of the spectrum and over-lapping at the yellow green lines. After the development of this tube, were it possible, we would try then various methods of combining these tubes with some form of mechanical control of the light so we could vary the light emanations therefrom and in this manner practically control the light as regards its color emanations.

Our factory, The Cooper-Hewitt Electric Company, a member of the large General Electric family, has produced in a practical manner this lamp after more than a year and a half of experiment and development. In other words, we have manufactured and are prepared to manufacture in quantities as desired a tube using a principle of incandescent neon gas that will supply emanations in the red portion of the spectrum.

Keenly anxious ourselves to assisit in any manner that we can, we have developed at the Hollywood shops two special Cooper-Hewitt outfits which are particularly suitable for close-up work. Each of these outfits consists of two Cooper-Hewitt U tubes and one Neon red light tube in the same light frame, said light frame being provided with the necessary devices for raising and lowering them and tilting the head, and also provided with slots so that various types of diffusing mediums may be used in conjunction therewith and the outfits are also provided with a mechanical diaphragm or shutter so the amount of red rays in the total light emanations may be varied at the will of the operator.

With these lamps effects may be varied so that an absolutely noonday sun or afternoon sunlight spectrum may be obtained at the will of the operator."

Charles J. Davis, A. S. C., has transferred his photographic activities from Warner Brothers' Vitaphone to Fox Movietone, New York.

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If Cows Didn't Eat Mustard We Wouldn't Have Moving Pictures

The photographic industry sprang from a mustard seed. At least, the mustard seed plays a most important part in that industry, for it is tiny traces of mustard oil, carried into the photographic emulsions through the gelatin, that make the silver salts sensitive to light, according to Dr. C. E. Kenneth Mees, director of the research laboratories of the Eastman Kodak Company. In his recent address before the American Society of Cinematographers, Dr. Mees explained "The Foundation of a Photographic Picture."

"The creamy white layer on the film used in a Kodak or motion picture camera is composed of billions of tiny microscopic crystals of silver bromide, of which there are more on a square inch than there are human beings on the surface of the globe," said Dr. Mees. "Recently the scientists of the Kodak research laboratories have studied these microscopic crystals, and have even studied the behavior of single crystals isolated from their neighbors. It has been found that the sensitiveness of the films is not owing to the grains of silver bromide only, but is in some way connected with the presence in those grains of specks of some other substance.

Accidental Impurity

"After a long and careful study, the Kodak research laboratories have found that these specks are produced by an accidental impurity present in the gelatin. This impurity is derived from the plants eaten by the animals from whose skins the gelatin is made. There is only a very small amount of it in the gelatin, but when the gelatin is used for making the film, the tiny bit of sulphur which the impurity contains reacts with the silver bromide and produces specks of silver sulphide on the crystals.

"In some way or other these specks increase the effectiveness of the light to which the film is exposed in the camera and enable the light to change the silver bromide so as to form a trace of metallic silver. The silver acts during the development as a nucleus on which more silver can deposit by the chemical process until the whole of the silver bromide crystal is changed into silver. Each of the original crystals of the film, therefore, after exposure to light becomes a grain of silver in the developed film, and it is of these grains of silver that the image projected on the screen is composed."

Forms Minute Battery

The speaker explained how Dr. S. E. Sheppard discovered that the sensitizing material in gelatine is mustard oil, and how in the production of the photographic emulsion it is changed to an alkali sulphide. He also pointed out the mechanism devised by A. P. H. Trivelli to explain how this trace of silver sulphide produced as tiny specks on the silver bromide grain causes enough silver to be produced to make the grain developable. Of this, Dr. Mees said:

"If we accept Trivelli's hypothesis, the silver bromide was made to conduct electricity by the light which fell on it, and for one-fiftieth of a second a current flowed through the little battery made of silver sulphide and a trace of silver. The current decomposed some of the silver bromide and produced a speck of silver. This speck then acted in development as a nucleus for the deposition of more silver until the whole exposed crystal was turned into a speck of black silver."

Sky Stuff

By Perry Evans, A. S. C.

In another air production which required desert scenery we chose Dry Lake, twenty miles from Victorville, as our location. After a few days out in the heat our pilots became restless and as an incentive were told that as soon as we finished we would fly to Mexicala and take on something cool and soothing and then fly back home. This we did, and not mentioning any names, one little "runt" aviator flying a ship in keeping with his own size insisted on entering into the Mexican atmosphere by drinking "tequilla." In going back to our ships the little man had to be carried most of the way, so I suggested that some one else fly his ship and let him ride back with some of the other pilots. To this the boys unanimously agreed that the midget was capable of flying his own crate, drunk or sober. After assuring us that he would refrain from all "monkey business" and keep his place in formation, we tucked him in his crate, strapped him down, turned over his motor and he took off with the rest of us.

For the first half hour everything went fine when suddenly friend Midget takes a nose dive out of formation with motor wide open, and while we held our breath, expecting to see him hit the ground at 300 miles an hour he levelled her off and nosed her almost straight into the air to an altitude of 3000 feet above us where he did every stunt known to aviation and a few that were never heard of, ending up by turning his ship upside down and flying in that position for a mile or more, then came back and took his place in formation. This performance he repeated two or three times before we arrived at our home port, where he came down and made a perfect three-point landing regardless of the fact he had more under his belt than when we strapped him in down on the border.

In reprimanding him for his action his excuse was that he had a little bottle on his hip, and being afraid to hold it to his mouth in the customary manner, for fear the terrific kick from the propeller would blow it out of his hand, he conceived the idea of crouching down behind the cowl to avoid wind resistance, holding the bottle between his knees and putting his mouth over the neck of it then turned his ship upside down and in that manner let the contents gurgle down his throat.

When asked why all the "monkey business" before turning his ship upside down, he replied: "Oh, that was when I was struggling with the bottle trying to get the cork out."

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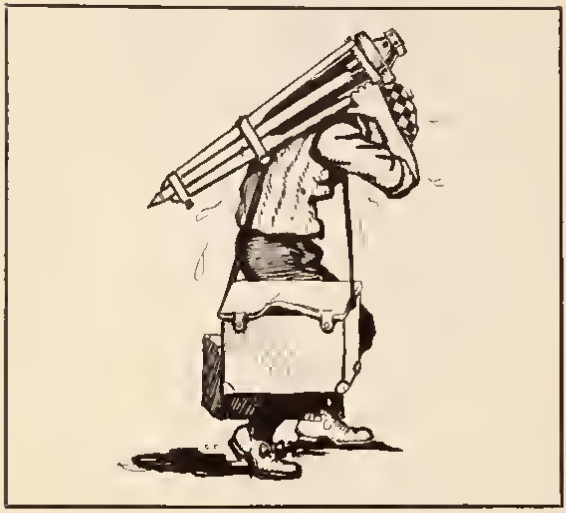

CONCERNING PANICS

I hate like thunder to preach; but when the hooey gets just so thick I kinda have to let go with some good fatherly advice. I'm sorry; but you ain't as stuck to read this as I am to write it.

The studios is all closing down. Most everybody is out. There ain't no jobs. There ain't no jobs in sight. Boo-Hoo. Razzberry! That kinda talk makes me sick—plenty.

Wait 'till you've been fired as often as I have and you'll feel different. I've been out on my neck so often that it just don't count—wouldn't seem nacheral, somehow if I wasn't bein' fired for sump'n or other.

But that ain't the point. Here's what's what. A lot of studios is closed and everybody's scared, and that's what makes me peevish. Why the scare? Why the panic? If you're due for the gate you're going to get it; and if you ain't you won't and that's that. It's a lead pipe cinch weeping and wailing about the possibilities one way or the other ain't helping matters none, but on the contrary, is hurting things a heluva lot . . . . . and that's what makes me sore. You'd think everybody in pictures was a lot of spoiled babies, the way they bellyache around about sump'n they're afraid maybe might happen.

The whole blamed truth about the matter is that pictures was never in as healthy a position as they are now. There ain't nothin' going to happen to 'em— that is, nothin' that shouldn't happen. Stop and think for a minute. The biggest investment in pictures is the theaters—biggest by many times. Our studio buildings and equipment is just a drop in the bucket compared to what's tied up in the Temples of the Cinema. What are they going to do—tear the seats out of the theaters and rent 'em out for garages or sump'n? Or maybe let the kids use the pipes out of the organs for blowguns? *Hooey*—and lots of it! *Sure* the studios is closing down—and maybe some of us is out of jobs, but that don't mean pictures is going on the rocks by a long way—no sir! Them theaters has got to have good pictures and lots of them—and that's as flat as your foot!

I said pictures was never in as healthy a condition as they are now and I sure mean it. Pictures has been awful sick for some time past—*awful* sick. For a long time they've been all bloated up out of any reasonable proportion and a lot of saps thought that was good. Well, it wasn't. Then again, a bunch of fast talkers had got hold of the game and was running it for what they could get out of it for themselves, and without any regard whatsoever to what kind of pictures they made while they were doing it. That's *another* thing that was wrong. Then we had the family system of hiring—one studio was fixed so that all the good jobs was held by one family. And then again, there was the social system of hiring and firing—you know; the system where the contracts were talked over on week ends and what not. That was all rotten—yet the patient *looked* fine. The patient —really awful sick all the time, looked good because everybody had jobs and money was rollin' in fine.

But jobs don't mean prosperity and activity don't mean work. A squirrel in a whirligig is plenty active but he don't get nowhere. Well, that's just what it's been like with pictures. We've been awful busy but we ain't done nothing—just ridin' on a merry-go-round.

To get right down to the ground, so's you can appreciate my worm's eye view of things, lets open the deal right up and *look* at it. Up until now everybody's been workin' for the guy right over him, ain't they? Cameramen have been workin' to please directors; directors has been workin' to please supervisors; and supervisors has been workin' to please the Big Boss and the Big Boss has been workin' to—what? Well, we don't know. Make money, maybe; but what we do know is this: everybody has been breakin' their necks to hold their jobs—NOT to make better pictures!

Now then, what happens? Everybody's trying to please somebody else and the result is that nobody pleases anybody. Meanwhile the poor dumb public is getting some lousy pictures.

A funny thing about the public is that it ain't got no voice. It don't never holler about nothin', no matter how hard it hurts. But the public has a funny way of doin' things on the quiet, and when they does these things somethin' usually happens—new Presidents or sump'n. And when the public started gettin' pictures that was a little bit *too* lousy to go to, they stopped going —that was all. No more of a holler than that—but it took.

We make lots of pictures. Lots of them. They all cost money. We're so used to shooting a quarter million or so on a picture that a quarter million doesn't mean as much to us in pictures as six bits does in cash money. But it's all money just the same, and it has to come from somewhere. Just where does it come from? You're right —the guys that's putting it up!

Now when the public—the poor dumb long-suffering public—slacked off on standing bad movies as tolerantly as they used to, somebody wanted to know why; and that somebody is the guys that's holding the sock—the guys

EASTMAN
PANCHROMATIC
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Are you attached to a False Alarm? If you are—worry!—for you're shore stuck! It's open season for Bluffers, Fast Talkers, Fakes, and Smart Guys—up to and including their friends.

The Boys who stuck their dough into pictures figuring to make a profit on the deal had an idea they'd get a square break. They didn't—and now they're here on the job to see that they do. And they'll *see*—don't ever kid yourself that they won't!

And that's why I say that pictures is right now today in its very healthiest condition—for they're at last under Honest Supervision—and the guy that's willing to shoot square, be he laborer, supervisor, prop-man, director, set-dresser, cameraman, or—well, yes, even stand-in—if he's willing to play square and give for what he gets, *he's* safe. BUT! Oh, *boy!* The smart ones that's been living on pull, family connection, or party ability—what a sock in the nose they've got coming! AND HOW!

Of course, this all don't mean a thing. I'm just a camera-punk and I don't see nothing or don't know nothing—but I have my guesses. This is one of them.

New "Light Transformer"

The American Society of Cinematographers has just received this self-explanatory telegram from the National Carbons Company, Inc., Cleveland, Ohio. This message, received at the time of going to press is published without comment. In the next issue the subject will be treated with full details:

Motion pictures industry to be benefited by invention of New Light Transformer stop The most recent invention in improving the light source for Panchromatic film has just been announced by the research laboratories of National Carbon Co. By a very simple combination of a carbon arc light with a special glass in place of the ordinary glass it is now possible to obtain a light richer in the reds and yellows compared with the blues than any other source of light ever used in the motion pictures industry. This invention which may be termed a light transformer is remarkable because of its very simplicity its use will enable studios to obtain from their present arc lamp equipment a most complete range of photographic light of the highest efficiency for either Orthochromatic or Panchromatic film. The color of the light source can be varied from the intense blue white of the white flame arc to the rich red yellow light obtained with the light transformer.

NATIONAL CARBONS CO., INC.

CLASSIFIED ADVERTISING

Rates: Four cents a word. Minimum charge one dollar per insertion. All copy must be prepaid and must reach us before the fifteenth of the month preceding publication.

American Cinematographer,
1222 Guaranty Building,
Hollywood, California

WANTED—MOTION PICTURE CAMERAS

170-DEGREE Bell and Howell wanted. Have 1324 Buick Sport Touring car, in excellent condition, as down payment. Remainder to be paid within six months of purchase. Write or phone Herman Schopp, care of the A. S. C., 1213 Guaranty Building, Hollywood, California. GRanite 4274 or GRanite 4704.

WANTED, CAMERA—Will buy Bell & Howell camera. State price and equipment. John P. Whalen. GL 1101 or A. S. C. GR 4274.

WANTED CAMERA—170 degree Bell & Howell camera. Would like Mitchell tripod. Harry H. Cooper, 351 No. Fuller Street. Phone GL 5233.

WANTED—Mitchell, for cash or will trade Bell & Howell and cash. Must be completed outfit. W. V. Skall. GR 6156, 1243¾ N. Fairfax, Hollywood, Calif.

WANTED—Will buy 170 degree Bell & Howell camera outfits. Must be in A-No-1 condition and priced right. Give full description and serial number. Wilding Picture Productions, Inc., 1358 Mullett Street, Detroit, Michigan.

WANTED—For cash, DeBrie, Pathe, Bell & Howell Standard cameras. Send full description. Bass Camera Company, 173 West Madison Street, Chicago.

FOR SALE—CAMERAS

FOR SALE—Akeley Camera. Complete equipment. Akeley Camera, equipped with 180 degree adjustable shutter and special side focusing prism, Panoramic Arm, Tilting arm, Telescopic pan handle, regular pan handle Ball and socket head. **Tripods,** Large tripod with Mitchell legs; Baby tripod adjustable legs. **Magazines,** Five standard Akeley Magazines, built in scratch-proof features. **Lens Equipment.** 1 pair 35 MM matched Carl Zeiss in Akeley mount. 1 pair 50 MM matched Carl Zeiss in Akeley mount. 1 pair 75 MM matched Carl Zeiss in Akeley mount. 1 8 in. matched finder Carl Zeiss in Akeley mount. 1 5¼ in. matched finder Carl Zeiss in Akeley mount. 1 8¼ in. matched finder Carl Zeiss in Akeley mount. 1 12 in. matched finder Dahlmeyer in Akeley mount. **Accessories,** Erect Mitchell finder with mounting to go on top of camera, Special Worth Matte box, matte on all lenses from 35 MM to and including the 8¼ inch lens, equipped for all kinds of mattes and glass filters both graduated sky and discs, etc. Auxiliary sun shade; Set of hard mattes and inside filter holders, Test tank, two foot capacity, changing bag. Special film rewind. **Equipment cases:** Lens case, special padding for travelling. Magazine case, holds five magazines; camera case, Accessory case, holds Worth matte box, Mitchell finder, six magazines and all accessories. These four cases are equipped with Yale locks. Tripod head case; Tripod case for large tripod. Tripod case for baby tripod. For sale by cash or will take trade-in on Bell & Howell camera. Call GR 4274 or GR 4704. Harry G. Mason, A. S. C.

FOR SALE—DeVry Projector, using standard film. Cost $225. New. (See machine in A. S. C. office, 1220 Guaranty Building). $100 cash or less. Make and offer. Call GR 4274.

FOR SALE—Bell & Howell Camera. 120 degree shutter. John Thompson, Escondido, Box 133, Route A.

FOR SALE, CAMERA—Super-speed Debrie equipment. 2-inch B. & L. Lens, 2 magazines, 1 tripod, 2 packs. Price $750.00. Abe Scholtz. See camera in A. S. C. office. GR 4274.

FOR SALE—New Eyemo camera carrying case, extra magazine. Price $225. Call Ben White, OX 7335.

FOR SALE—Brand new Wilart, never used, with 50 MM Carl Zeiss F-3.5 lens in Micrometer mount. 200 ft. magazine carrying case. Cost $175. Best offer takes it. Write Art-Craft Jewelry Co., Wollaston, Mass.

FOR RENT—CAMERAS

FOR RENT—Three Bell & Howell 170 Degree Cameras, F. 2.3 and F. 2.5 lenses, Mitchell Tripod legs. Complete equipment. Eddie Linden, 6017 Elinor Ave., Hollywood, HEmpstead 8333 or A. S. C. office, GR 4274, GR 4704.

FOR RENT—2 Mitchell cameras complete studio equipment. No. 85 regular movement, No. 37 high speed movement. 40 MM and 75 MM Astro 1.8 lenses. 50 MM 2.3 Astro. Extra magazines for rent. Also Eyemo camera with Hoefner Trueball tripod head. Pliny W. Horne, 1318 N. Stanley Ave., Hollywood 7682.

FOR RENT—170 Bell & Howell 2.3 Astro 2″. Carl Zeiss 35 MM 2″ and 3″ Mitchell Finder, Mitchell Tripod and tripod head. Ira B. Hoke, 1312 N. Detroit St., GR 5033.

FOR RENT—Camera equipment. 1 Mitchell Camera, 1 Mitchell Speed Camera with attachment, new. 1 Bell & Howell, 1 Akeley (Full Equipment). Ted Tetzlaff. Phone CR 3255. 1724 N. Western Ave., Hollywood.

FOR RENT—Complete Mitchell outfit with astro lenses, six magazines, by Al Gilks. HE 1430.

FOR RENT—To reliable party, one Bell & Howell camera with Mitchell legs; Astro Lens F. 2.3. Fl. 8. 3 magazines. Fred Hoefner mat box. In perfect shape and fully equipped. Joe LaShelle. ORegon 5730.

FOR RENT—Two Bell & Howell cameras, large finders, astro lenses, F. 2.3. B. & L. 2.7. Frank Cotner. HO 5046.

FOR RENT, CAMERA—3 Bell & Howells. Fully equipped. Lenses 2.3, 2.5 and 2.7. Large finders, Baby tripod. No. 3 Lense. Special side prism. Also Special Hi speed DeBrie. Call B. B. Ray, A. S. C. Office, GR 4274. Home, OL 2727. 1119 N. Edgemont Ave.

FOR RENT—CAMERAS, ALL KINDS. Akeley, Bell & Howell 170°, also Speed DeVry Graflex, Still (late model Anscos). For rent by day or week to responsible parties. Ries Bros., Ries Bldg., 1162 No. Western Ave. Phone GRanite 1135; Residence, HO-1055.

MITCHELL and Bell & Howell cameras. F 1.8 and F.2.3 lens equipment. All kinds of lenses and equipment for rent. John S. Stumar, 3632 Cardiff Ave., Palms, Los Angeles. Phone: Culver City 3512, or call C. Glouner, Camera Dept., Universal City, HEmpstead 3131.

ONE DE VRY Motion Picture Camera. Complete outfit. Alvin Wyckoff, Phone Care A. S. C., GRanite 4274.

BELL & HOWELL. Victor Milner, 2221 Observatory Ave., Los Angeles, California. 596-644.

BELL & HOWELL—Phone Perry Evans, OL 8797 or Hollywood A. S. C.

MITCHELL Friction Tilthead, 3 Mitchell cameras, 2 Bell & Howell Astro F. 1.8, F. 2.3 lenses. Extra lenses and magazines. J. R. Lockwood, 523 N. Orange St., Glendale. Glen. 3361 W. Hollywood address, 356 Seward, HO 4366.

E. BURTON STEENE, Bell & Howell, and Akeley. Complete Camera equipment. Latest models. Address American Society of Cinematographers, Hollywood, California.

BELL & HOWELL, 173, with 30, 40, 50 and 75 lens equipment. Baby tripod. Also B. & H. Cine motor. Charles Stumar, GRanite 3345. 7501 Lexington Ave., Hollywood.

FOR TRADE—CAMERAS

WILL TRADE—Carl Zeiss, F. 3.5, 50 mm. lens in B. & H. mount. Trade for late model Veedor Counter. Bert Longenecker, 537-724.

FOR RENT—STILL CAMERAS

FOR RENT 1 8x10 Still Camera, focal plane shutter, complete, 1 Mitchell Friction Tripod, new, for B. & H. 1 Eyema Camera with special lock. 1 4x5 Graflex B. & L. lens. 1 B-H. Low Boy to fit new style B-H Tripod head. Joe LaShelle, 533 N. Sierra Bonita, ORegon 6730.

ONE 8x10 still camera—complete. Care A. S. C., GRanite 4274.

FOR RENT—MISCELLANEOUS

FOR RENT—One Cinemotor with Veeder Counter in first-class shape. Call B. B. Ray, OL-2727, 1119 N. Edgemont Street.

FOR SALE—LENSES

FOR SALE, LENSES—Carl Zeiss, F. 3.5, 50 mm., mounted in latest B. & H. mount. Looks like new. Perry Evans, 413 No. Marposa Ave., Hollywood, California.

BELL & HOWELL, all ASTRO lenses. Akeley Camera complete, also Eyemo. E. Burton Steene, 1750 No. Wilcox Ave., GLadstone 5131.

ONE two-inch Bausch & Lomb F.2:7; one Dahlmeyer Peutac 37 mm. F 2.3. Georges Benoit, care of American Society of Cinematographers, Hollywood, California.

NEW 40 mm Goerz Hypar f. 3.5 lens in Bell & Powell mount; price, $50.00. Write Charles Clarke, 1222 Guaranty Building, Hollywood, California.

WANTED—PROJECTOR

USED SIMPLEX wanted. State model, price, condition, etc. Address Box R, American Cinematographer.

WANTED—MISCELLANEOUS

FOR RENT, LENSES—Trick lenses of all descriptions for rent by day or week. Call George Meehan, A. S. C. Phone GR 3330, 744 North Curson Ave., Hollywood, California.

WANTED—Will buy Bell & Howell cinemotor and a 32 M. M. Lense. Call Herman Schopp, HOlly 4735 or care A. S. C. office, GR. 4274.

FOR SALE—SPECIAL CAMERA EQUIPMENT

COMPLETE new style Ball & Howell matt box for sale. Joseph B. Walker, 1337 N. Sycamore Ave., Hollywood. Phone GLadstone 3767.

PATHE panorama head for professional camera, with detachable aluminum tilting head, easily adapted to any standard tripod. A first-class unit for some one, who is experimenting or engaged in research work, to add to their equipment. Stephan S. Norton, care A. S. C., Guaranty Bldg., Hollywood.

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The original motion picture film..... workable long rolls.....colored film base.... duplicating film...panchromatic negative... the history of important developments in American motion picture materials is a factful story of this Company's cooperation with the cinematographic industry.

Obviously an association that has borne such fruits in the past can be expected to repeat in the future. For 1929 Eastman resources and Eastman cooperation are pledged anew to the further advancement of the motion picture art.

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